Theodore Besterman

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Imprimatur hic Liber,

cui titulus,

The Natural History of Oxford-shire.

R A: B ATHU R S T,

Vice-Cancellar. *O X O N.*

April. 13. 1676.

THE

NATURAL HISTORY

OF

OXFORD-SHIRE,

Being an Essay toward the *Natural History*

OF

ENGLAND.

By *R. P.* LL. D.

—πάντα γὰρ ὕπω
Ἐκ Διὸς ἀνθρωποι γιγνώσκομεν, ἀλλ' ἔτι πολλὰ
Κέκρυπται. Arat. in Phænom.

Printed at the THEATER in *OXFORD*, and are to be had there:
And in *London* at Mr. *S. Millers*, at the *Star* near the
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To the moſt Sacred Majeſty of

Charles the Second,

By the Grace of GOD,

King of *Great Britan, France* and *Ireland,*

Defender of the FAITH, &c.

May it pleaſe Your Majeſty,

I had certainly been an unpardonable preſumtion for ſo mean a perſon as the Author of this Eſſay, to have preſented Your Majeſty with a yet meaner diſcourſe, had not the ſubject of it alwaies deſerved the notice, and the Enquirers into it, the favor of Princes. Thus had *Ariſtotle* in writing his Treatiſe of Animals the aſsiſtance of *Alexander*; and *Pliny* the Patronage of *Titus Veſpatian* to his Natural Hiſtory.

Beſide, this attemt ſeems more juſtly to belong to Your Majeſty, than any of their Hiſtories to their reſpective Patrons, it being ſo far from exceeding Your Majeſties Dominions, that it contains but an Enquiry into one of the ſmalleſt parts of them; *viz.* Your alwaies Loial County and Univerſity of *Oxford*, whereas their Volumes are bounded only with the Univerſe.

Yet what more particularly moved me to preſent it to Your Majeſty, is not only Your favor to Learning in general, and eſpecially to this place; but much more Your Majeſties exquiſit inſight into the matter it ſelf, inſomuch that though the former might have given me ſome confidence of Your Majeſties acceptance, yet it ſeems more my intereſt to appeal to Your Judgment, and humbly to implore Your Majeſties deciſion, VVhether if *England* and *Wales* were thus ſurveyed, it would not be both for the honor, and profit of the Nation?

VVhich deſign, if Your Majeſty think fit to diſapprove, it will yet be ſome ſatisfaction to the Author, that he has ſhewed his ready (though miſguided) zeal to ſerve his Country: But if Your Majeſty ſhall judge it advantageous to the Kingdom, or but any way worthy Your Majeſties diverſion, there ſhall none more induſtriouſly and chearfully proceed in it, than

Your Majeſties moſt Loial

and

moſt obedient

Subject,

Rob. Plot.

To the Reader.

THough this Eſſay *has ſwell'd to ſo much greater a* Bulk *than ever I expected it could poſſibly have done, that I might well have ſuperſeded any further addreſs than that of* Dedication; *yet it being but neceſſary to acquaint the* Reader *with ſome matters, that are general, and will ſerve for all other* Counties *as well as* this, *I thought good to put them down briefly as followeth.*

And firſt, that though I dare not pretend the Map *of* Oxford-ſhire *prefixt to this* Eſſay, *is ſo accurate as any I ſhall make hereafter, yet I dare promiſe the* Reader *it far exceeds any we had before; for beſide that it contains all the* Mercat Towns, *and many* Pariſhes *omitted by* Saxton, Speed, &c. *it ſhews alſo the* Villages, *diſtinguiſhed by a different* mark *and* character, *and the Houſes of the* Nobility *and* Gentry, *and others of any magnitude within the* County; *and all theſe with their* bearings *to one another, according to the* Compaſs.

And as for the diſtances, *though I dare not promiſe them* Mathematically *exact (which by reaſon of the* riſings *and* fallings *of the ground,* interpoſitions *of* Woods, Rivers, &c. *I think ſcarce poſſible in many places to be given at all) yet ſome few of them are as* true, *as actual* dimenſuration, *and moſt of them as the doctrin of* Triangles, *and the beſt information, all compared together, could direct me to put them: So that provided they have not been moved in the* Graving (*as I think they have but little*) *I take them all ſeated not far from the* truth.

As for the ſcale *of* miles, *there being three ſorts in* Oxford-ſhire, *the greater, leſſer, and middle* miles, *as almoſt every where elſe; it is contrived according to the middle ſort of them; for theſe I conceive may be moſt properly called the true* Oxford-ſhire *miles, which upon actual* dimenſuration *at ſeveral places, I found to contain for the moſt part* 9 furlongs *and a* quarter, *of which about* 60 *anſwer a* Degree: *Where by the way its but expedient that the* Reader *take notice, that I intend not that there are* 60 *of theſe* miles *in a degree, according to the common account; for reckoning* 5280 *feet, (or eight*

furlongs) *to a* mile, *as is usual in* England, *no less than* 69 *will correspond to a* degree; *upon which account it is and no other, that of the middle* Oxford-shire *miles, each containing* 9 furlongs *and a* quarter, *about* 60 *will do it.*

According to these miles, *the* degrees *of* North latitude *are divided into* minutes *on each side the* Map, *chiefly made off from the exact* Northern *latitude of* Oxford, *collected from the many years observations of* Dr. Banbridg, *and at last concluded to be seated in the* 46 minute *of the* 51 degree, proxime; *the* 52nd degree *beginning at the small line passing through* Mixbury, Clifton, *north of* Deddington, *the two* Barfords, South Nuneton, *and between* Hoke Norton *and the* Lodge: *By which division 'tis easie to know to a* minute *of a degree, nay almost to a* second, *in what latitude every* Town, Parish, Village, *and* Gentlemans *House is seated.*

Beside, for the Houses *of the* Nobility *and* Gentry, *this* Map *is so contrived, that a* Foreigner *as well as* English-man, *at what distance soever, may with ease find out who are the* Owners *of most of them; so as to be able to say that this is such or such a* Gentlemans *House: And all this done by* Figures *put to every such* House, *which referring again to* Figures *of the same value, placed in order over the* Arms *in the* Limb *of the* Map, *shew in the bottom of each* Shield *the* Nobleman *or* Gentlemans name, *whose house it is; their respective* Coats *of* Arms *being always placed between the* Figure *and* Name: *which too (all but some few) are cut in their* metals, furs, *or* colours, *as born by their* Owners.

And not only the Shields, *but* Ordnaries, Charges, Differences, &c. *where they are not too small: if* Argent, *being left* white; *if* Or, *filled with small points*; *if* Gules, *lineated* perpendicularly, *or in* pale; *if* Azure, horizontally, *or* fess-ways; *if* Vert, obliquely *or* bend-ways; *if* Sable, *both* pale *and* fess-ways, *as may be seen in the* Map, *which are all the* colours *made use of there. And if ever hereafter I shall meet with any bearing* Purpure, Ten. *or* Sanguine; *the first shall be represented with* Lines *in* bend sinister; Ten, *with* lines salter-ways, *mixt of* Vert *and* Purpure; *and* Sanguine, paly bendy, *mixt of* Gules *and* Purpure.

According to this method, *not only the* Arms *of the* University, *all the* Colleges, *and* Towns incorporate *in the* County (*which I have placed in the upper margin of the* Map) *but on the sides and bot-*

tom

tom, thoſe of the Nobility *and* Gentry, *are induſtriouſly ranged in* Alphabetical *order, to avoid the difficulties that might otherwiſe have riſen about* precedency: *which, beſide the uſe above mentioned of diſcovering the* Owners *of the Houſes, and that they are an ornament to the* Map, *I hope may alſo have theſe other good* effects. 1. *That the* Gentry *hereby will be ſomwhat influenced to keep their* Seats, *together with their* Arms, *leaſt their* Poſterity *hereafter, not without* reflexions, *ſee what their* Anceſtors *have parted with. And ſecondly,* Vagabonds *deterr'd from making counterfeit* Paſſes, *by puting falſe* names *and* Seals *to them, both which may be diſcovered by ſuch* Maps *as theſe.*

To theſe add the ancient houſes of Kings, *the principal* Seats *of ancient* Baronies, *ancient* Ways, Fortifications, *and the ſites of* Religious houſes, *all diſtinguiſh'd as deſcribed by their reſpective* marks *in the* Table *for that purpoſe. All which put together, make the* ſum *of the* Map, *as I intend they ſhall in all others hereafter, ſo that thoſe* Memento's *need no more be repeated, ſince they are deſigned to be applyed to all following* Maps *as well as this.*

Yet this Map, *though it contains near five times as much as any other of the* County *before, partly by reaſon of its being the* firſt *I ever made, and partly becauſe, either of the pure* ignorance *or* abſence *of ſome, and over* curious pieviſhneſs *that I met with amongſt others, is not ſo perfect, I confeſs, as I wiſh it were; there being upon theſe accounts, ſome few* Arms *omitted, and others out of place at the foot of the* Map, *and perhaps here and there a* Village *overlook'd: wherefore I have entertained ſome thoughts of cutting it again, and perhaps ſomwhat larger, to be hung up in* Frames (*without alteration of this for the* Book) *with all the* defects *abovementioned ſupplyed; provided ſuch* Gentry *as find their* Arms *omitted, or any* Villages *near them containing ten houſes (under which number I ſeldom think them worth notice) pleaſe to bring in their* Arms *in* colours, *with the particular* bearings *and* diſtances *of their* Houſes *and* Villages, *from the moſt noted place near them, to the* Porter *or one of the* Keepers *of the* Bodleyan Library, *who will be ready to receive them, or any other Curioſity of* Art *or* Nature, *in order to the compiling an* Appendix *to this* Work, *to be Printed apart.*

Which is all concerning the Map, *but that the* Reader *alſo note,*

that

that the Right Honorable the Earl of Berkſhire, *Lord* Lovelace, &c. *are deſignedly left out, in regard that though they have* Eſtates *and* Seats *in this* County, *yet their chiefeſt, and places of moſt common reſidence being elſewhere, I have choſen rather to omit them here, and to place them in* thoſe *that ſeem their more deſirable* Counties.

Concerning the Hiſtory *it ſelf, I can adviſe little more, but that I undertook it at firſt for my own* pleaſure, *the ſubject of it being ſo pleaſant, and of ſo great variety, that it ſurpriſed me to think how many Learned* Ages *had paſt (careful and laborious enough in compiling the* Civil *and* Geographical *Hiſtories of* England) *without ſo much as ever attemting that of* Nature *or* Arts: *it ſeeming to be a deſign (had the* Undertaker *been ſuitable) more highly deſerving of the publick too, than either of the former, as tending not only to the advancement of a ſort of* Learning *ſo much neglected in* England, *but of* Trade *alſo, which I hope in ſome meaſure is made to appear in the following* Treatiſe.

Which though ſufficient to juſtifie my choice of this ſubject, *yet I ventured not upon it without the joint approbation of the moſt knowing in theſe matters, ſuch as the Honorable* Robert Boyle *Eſq*; Dr. Willis, Dr. Wallis, Dr. Bathurſt, &c. *whoſe celebrated names ſerving to remove the groundleſs ſuſpitions many had of the attemt, I proceeded to give this* Specimen *of it: Wherein the* Reader *is only deſired to take notice, that moſt of the* Curioſities, *whether of* Art, Nature, *or* Antiquities *engraven in the* Cuts, *are ſo certain truths, that as many as were portable, or could be procured, are in the hands of the* Author. *But for ſuch things as are inſeparable from their places, they remain to be ſeen as in the Hiſtory directed, there being nothing here mention'd, but what either the* Author *has ſeen himſelf, or has received unqueſtionable* teſtimony *for it, which for the moſt part, if not alwaies, the* Reader *will find cited.*

In the Philoſophical *part, I have chiefly embraced the* Principles *of Dr.* Willis, *as the moſt univerſally known and received, and therefore moſt likely (in this* inquiſitive Age) *to be the trueſt; which if I have any where miſ-applied (as 'tis manifold odds ſome where or other I may) yet I doubt not but the Learned and ſober* Reader *will candidly accept of the* honeſty *of my* endeavor *in excuſe of my* Error. *But as for the hot-headed half-witted* Cenſurer, *who perhaps only looks on the Title of a* Chapter, *or here and there a* Paragraph *that makes for his*

his turn, I must and do expect the lash of his tongue, it being indeed his business to find out the lapses, *and decry all* attemts, *wherein* (forsooth) *he himself has not been consulted: But I would have such to know (that if I meet with but proportionable encouragement from the former) 'tis not all they can say or do, shall discourage me from my* purpose; *for if I have erred in any thing, I shall gladly receive the calm reproofs of my* Friends, *and still go on till I do understand my business aright, in the mean time contemning the* verdict *of the* ignorant *and* fastidious *that throw words in hast.*

THE

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THE

NATURAL HISTORY

OF

Oxford-ſhire.

CHAP. I.

Of the Heavens and Air.

OXFORD, being not undeſervedly by Mr. *Cambden* ſtiled, *Our moſt noble Athens*, *The Muſes ſeat*, and, *One of* Englands *Pillars*; nay, *The Sun*, *The Eye*, &c. It would have occaſion'd as ſtrange a remark, as any to be mention'd in this whole Eſſay, had there not ſome eminent Celeſtial Obſervations been made in this County; eſpecially ſince that ſtupendous Mathematical Inſtrument, now called the *Teleſcope*, ſeems to have been known here above 300 years ago. But theſe being chiefly matters of Art, relating either to the diſcovery of the magnitude, figure, or determination of the motions of the Heavenly Bodies, muſt be referr'd (as moſt proper) to the end of this Work; it being my purpoſe in this *Hiſtory of Nature*, to obſerve the moſt natural method that may be.

2. And therefore I ſhall conſider, firſt, Natural Things, ſuch as either ſhe hath retained the ſame from the beginning, or freely produces in her ordinary courſe; as *Animals*, *Plants*, and the *univerſal furniture of the World*. Secondly, her *extravagancies* and *defects*, occaſioned either by the exuberancy of matter, or obſtinacy of impediments, as in *Monſters*. And then laſtly, as ſhe is reſtrained, forced, faſhioned, or determined, by Artificial Operations. All which, without abſurdity, may fall under the general notation of *a Natural Hiſtory*, things of Art (as the Lord *Bacon* [a] well obſerveth) not differing from thoſe of Nature in *form* and *eſſence*, but in the *efficient* only; Man having no power

[a] *De Augm. Scient. Lib. 2. cap. 2.*

over Nature, but in her matter and motion, *i. e.* to put together, ſeparate, or faſhion natural Bodies, and ſomtimes to alter their ordinary courſe.

3. Yet neither ſhall I ſo ſtrictly tie my ſelf up to this method, but that I ſhall handle the two firſt, *viz.* The ſeveral *Species* of natural things, and the errors of Nature in thoſe reſpective *Species*, together; and the things Artificial in the end apart: Method equally begetting iterations and prolixity, where it is obſerved too much, as where not at all. And theſe I intend to deliver as ſuccinctly as may be, in a plain, eaſie, unartificial Stile, ſtudiouſly avoiding all ornaments of Language, it being my purpoſe to treat of Things, and therefore would have the Reader expect nothing leſs then Words: Yet neither ſhall my Diſcourſe be ſo jejune, as wholly to conſiſt of bare Narrations, for where the ſubject has not at all, or but imperfectly been handled, I ſhall beg leave either to enlarge, or give my opinion.

4. Since then the Celeſtial Bodies are ſo remote, that little can be known of them without the help of Art, and that all ſuch matters (according to my propoſed method) muſt be referred to the end of this Book: I have nothing of that kind to preſent the Reader with, that's local, and ſeparate from Art, but the appearance of two *Parhelia* or mock-Suns, one on each ſide of the true one, at *Enſham* on the 29th of *May*, early in the morning, in the year 1673. With them alſo appeared a great circle of light concentrical to the true Sun, and paſſing through the disks of the ſpurious ones, as in *Tab.* 1. *Fig.* 1. which though I ſaw not the *Phænomenon*, is as truly drawn (for ſo it was confeſt by ſome that did) as I could poſſibly have done it if perſonally preſent; and yet ſo incurious was the amazed multitude, that they could not ſo much as give me ground to gueſs at the *diameter* of the circle, much leſs whether it were interrupted in ſome of its parts, or interſected (as they uſually are) with any other circles of a fainter colour.

5. Whether theſe appearances are cauſed by reflection or refraction in the Clouds, according to the old Philoſophy; or by both, in a great annulary cake of Ice and Snow, as *Des Cartes*; or by ſemiopaque *Cylinders*, as *M. Hugens de Zulichem*, will be too too tedious here to diſpute. Let it therefore at preſent ſuffice, that this *Phænomenon* is worthy our notice, in regard,

1. That

1. That no circle passes through the true Suns disk, nor the spurious ones found in the intersection of two *Irides*, as in those that appeared at *Rome*, *March* 20. 1629. [b] and in *France*, *April* 9. *Anno* 1666. [c]
2. That whereas generally such mock-Suns appear not so bright, nor are so well defined as the true one is; these according to the agreement of all, appeared of so even and strong a light, that 'twas hard to distinguish the true from the false, and perhaps might not be inferior to the *Parhelia* mention'd by *Cardan* [d], or that lately were seen in *Hungary*. [e]

6. When they appear thus bright and illustrious, Astrologers heretofore always presaged a Triumvirate: thus the Triumvirate of *Antonius*, *Augustus*, and *Lepidus*, with all the evils that attended it, was referred to the *Parhelia* seen a little before; and herein *Cardan* is so positive, that he fears not to assert, That after such an appearance, we seldom (if ever) fail of one, and therefore refers the *Parhelia* seen by himself to the Triumvirate of *Henry* the second King of *France*, *Charles* the fifth, and *Solyman* the Turkish Emperor. And truly, were not these to be more than suspected of vanity, it were easie to adapt a Triumvirate to ours: But my Religion, and that God that hath exhorted us, *not to be dismayed at the signs of Heaven*, and solemnly professes, that 'tis even He *that frustrates the tokens of the Lyars, and makes the Diviners mad* [f], has taught me to forbear. I shall therefore add no more concerning these things, but that though most commonly the *Parhelia* with the true Sun, appear but three in number, yet that somtimes more have been seen; as four [g] in *France*, *Anno* 1666. five [h] at *Rome*, *Anno* 1629. five [i] in *England*, *Anno* 1233. and six [k] *Anno* 1525. by *Sigismund* the first, King of *Poland*; which are the most that we read were ever seen at a time, though *Des Cartes* endeavors to shew 'tis possible there may be seven.

7. And indeed this had been all I thought I should have mentioned concerning the Heavens, but that even now while I am writing this, at *Oxon:* on the 23[d] of *November*, *Anno* 1675. about 7 at night, behold the Moon set her Bow in the clouds, of a white

[b] *Des Cartes Meteor cap.* 10. *& Gassend. in Ep. ad Renerium.* [c] *Philos. Transf. num.* 13. [d] *De rerum Varietate lib.* 14. *c.* 70. [e] *Philos. Transf. numb.* 47. [f] *Isa.* 44. *v.* 24, 25. [g] *Philos. Transf. numb.* 13. [h] *Des Cartes, Meteor. cap.* 10. [i] *Matthew Paris*, 17 *Henr. III.* [k] *Des Cartes Meteor. cap.* 10. *& Fromond, Meteor. Lib.* 6. *Art.* 2.

colour, entire and well determined, which continued so for about half an hour after I first saw it. The reason why such appear not of divers colours, as Rain-bows do that are made by the Sun, has been always ascribed by Philosophers, to the weakness of the Moons raies, not entring so deeply into the opacity of the clouds. But if we may give credit to [l] *Dan: Sennertus*, it has once to his knowledge happened otherwise, *viz.* in the year 1593, when after a great storm of Thunder and Lightning, he beheld an *Iris Lunaris* adorned with all the colours of the Rain-bow. As for ours, though I could not perceive in any part of it, that it had the least shade of any colour but white; however, I thought it not unworthy our notice, not only for the infrequency of the thing(they never happening but at or near the Moons full, and then but so very seldom too, that [m] *Aristotle* professes, that he saw but two in above fifty years; and I know several learned and observing Men, that never saw such an *Iris* in their lives) but also because of the great clemency of the weather, that followed upon it at that time of the year; there falling not one drop of rain, nor any wind stirring for sixteen days after, but so great a serenity, that the waies were as clean and passable then, as we could wish or ever enjoyed them at Midsummer.

8. From the Firmament (waving all considerations of the pure *Æther*, of which we know so little, that I shall say nothing) I naturally descend to the lowest Heaven, I mean that subtile Body that immediatly incompasses the Earth, and is filled with all manner of exhalations, and from thence commonly known by the name of the *Atmosphere*. Whether beside these exhalations, there be any peculiar simple body, called Air, I leave to the more subtile Philosophers, and consider it here only, as 'tis the subject of storms, of thunder and wind, of *Echo's*, and as it has relation to sickness and health.

9. As to Tempests that have happen'd in this County, though perhaps there have been some heretofore attended with as deplorable effects as any where else; yet because they are no where transmitted to posterity, I shall only mention two within our memory, *viz.* The storm of wind that happen'd one night in *February*, *Anno* $166\frac{1}{2}$, which though general (at least all over

[l] *Sennertus in Epitom. Phys.* [m] Ἐν ὀπτὼ ἐτῶν μόνον. *Meteor. lib.* 3. *cap.* 2.

England)

England) yet was remarkable at *Oxon*: in these two respects. 1. That though it forced the stones inwards into the cavity of *All-hallows* Spire, yet it over-threw it not. And 2ly. That in the morning, when there was some abatement of its fury, it was yet so violent, that it laved water out of the River *Cherwell*, and cast it quite over the Bridge at *Magdalen* College, above the surface of the River near 20 foot high; which passage, with advantage of holding by the College walls, I had then the curiosity to go see my self, which otherwise, perhaps, I should have as hardly credited as some other persons now may do. But those that have sailed to the *Indies* can inform them what force *Hurricane's* and *Turbo's* have, with what violence and impetuosity they take up whole Seas of water, and furiously mount them into the air [n]. Now that such as these may also happen at Land (though perhaps for the most part of less strength) I think we have little reason to doubt, since our own Chronicles inform us, that in Q. *Maries* time, within a mile of *Nottingham*, all the houses of two little Parishes, with their Churches, were wholly born down by such a Tempest; and the water, with the mud from the bottom of the River *Trent*, that ran between them, carryed a quarter of a mile and cast against Trees, with the violence whereof they were torn up by the roots.

10. Of much such another Land *Hurricane*, *Bellarmin* gives us a relation so incredible, that he himself premiseth, *Quod nisi vidissem non crederem. Vidi* (saies he) *à vehementissimo vento effossam ingentem terræ molem, eamque delatam super pagum quendam, ut fovea altissima conspiceretur unde eruta fuerat, & pagus totus coopertus & quasi sepultus manserit, ad quem terra illa divenerat* [o]. Which being sufficient (I suppose) to evince the possibility of my story, I proceed to

11. The second tempest of Thunder and Lightning, on the 10th of *May*, 1666. which though terrible enough to all parts adjacent to *Oxford*, yet was mischievous only at *Medley*, a well known House, about a mile or somwhat more distant from it; two Scholars of *Wadham* College, alone in a boat, and new thrust off shore to come homewards, being struck off the head of the boat into the water, the one of them stark dead, and the other

[n] *It was observed by an able Sea-man of* Bristol, *that this wind was the fag-end of a* Hurricane, *which began in* New-England *about three hours before it came hither; the Sea-men observ'd that it went directly towards* England. [o] *Bellarmin. de ascens. ment. in Deum, Grad.* 2. *cap.* 4.

struck

ſtuck faſt in the mud like a poſt, with his feet downward, and for the preſent ſo diſturbed in his ſenſes, that he neither knew how he came out of the boat, nor could remember either Thunder or Lightning that did effect it. Others, in another boat about ten or twenty yards diſtance from the former, felt a diſturbance and ſhaking in their boat, and one of them had his chair ſtruck from under him, without hurt. But of this no more, a full relation of the accident being already given by the Reverend and Learned D^r *John Wallis Savilian* Profeſſor of Geometry in the Univerſity of *Oxford*, and publiſh'd in our Engliſh Philoſophical Tranſactions [p].

12. What hapned before or after thoſe Tempeſts, I was not ſo curious in thoſe days to obſerve, but it might indeed be wiſh'd, as the learned and obſerving D^r *Beale* adviſes [q], that ſome old Almanacks were written inſtead of new; that inſtead of the conjectures of the weather to come, ſome ingenious and fit Perſons would give a faithful account from divers parts of the world, not only of the Storms, with the antecedents and conſequents of them, but of the whole weather of the years paſt, on every day of the month: as it was induſtriouſly begun above 300 years ago, by *William Merle* Fellow of *Merton* College, who obſerved the weather at *Oxford* for every day of the month for 7 years together; *viz.* from *January Anno Dom.* 1337, to *January Anno Dom.* 1344. the MS copy of which Obſervations yet remain in the *Bodleyan* Library [r]: For from hence in time we might examine upon ſome grounds, as the learned D^r *Beale* well remarks, how far the poſitions of Planets, or other ſymptoms or concomitants, are indicative of weathers, and probably be forewarn'd of Dearths, Famines, Epidemical Diſeaſes, *&c.* and by their cauſes be inſtructed for remedies, or prevention. Certainly from ſuch Calendars we might learn more in few years, then by Obſervations at random all the days of our lives; and if they might be had from foreign and remote parts *, we ſhould then be in ſome hopes of true Inveſtigations of heats and colds, and of the breadth and bounds of coaſting Rains and Winds.

13. Next the Tragedies (it being as agreeable to my Method, as ſeaſonable to the Diſcourſe) it will not be amiſs to preſent the

[p] *Philoſoph. Tranſact. Numb.* 13. [q] *Philoſoph. Tranſact. Num* 90. [r] *MS. Digby, fol.* 176. * *Such obſervations of the weather every day of the month through the whole year* 1671. *were made by* Eraſmus Bartholine, *and are printed* inter Acta Medica Tho. Bartholini Obſ. 130.

Reader

Reader with ſome of the ſports of Nature, and entertain him awhile with the Nymph *Echo*; a Miſtreſs ſhe is indeed that is eaſily ſpoke with, yet known to few: if therefore I take pains to acquaint him with her, I hope I ſhall not perform a thankleſs office.

14. Firſt therefore, that *Philechus* may not be out in his choice, whenever he attempts to court her in *Oxford-ſhire*, he muſt know that of theſe there are ſeveral ſorts, and may beſt, I ſuppoſe, be diſtinguiſh'd by their Objects, which are,

- either are
  - *Single*, ſuch as return the voice but once; and theſe again
    - are either
      - *Polyſyllabical*, ſuch as return many ſyllables, words, or a whole ſentence.
      - *Tonical*, ſuch as return the voice but once, nor that neither, except adorned with ſome peculiar Muſical note.
  - *Manifold*, and theſe return ſyllables and words, the ſame oftentimes repeated, and may therefore be ſtiled *Tautological Echo's*, which are cauſed
    - either by Simple / Double Reflexion.

15. As for *Polyſyllabical articulate Echo's*, the ſtrongeſt and beſt I have met with here, is in the Park at *Woodſtock*, which in the day time, little wind being ſtirring, returns very diſtinctly ſeventeen ſyllables, and in the night twenty: I made experiment of it with theſe words,

—Quæ nec reticere loquenti,
Nec prior ipſa loqui didicit reſonabilis Echo.

In the day it would return only the laſt verſe, but in the night about twelve by the clock, I could alſo hear the laſt word of the former *Hemiſtick* [*loquenti.*] The object of which *Echo*, or the *Centrum phonocampticum*, I take to be the hill with the trees on the *ſummit* of it, about half a mile diſtant from *Woodſtock* town, in the way thence to the Right Honorable the Earl of *Rocheſter*'s Lodge: And the true place of the Speaker, or *Centrum phonicum*, the

the oppoſite Hill juſt without the gate at the Towns end, about thirty paces directly below the corner of a wall incloſing ſome hay-ricks, near *Chaucers* houſe: ſome advantage I gueſs it receives from the rivulet that runs as it were in a direct line between the two centers, and from the pond at the foot of the object hill; as alſo from two other hills that run obliquely up to it: Which may better be apprehended by the proſpect of the place, as in *Tab.* 1. *Fig.* 2.

16. That this *Echo* makes return of ſo many ſyllables, and of a different number in the day and night, being indiſputable and matter of fact; I proceed in the next place to the reaſons of theſe certainties, which poſſibly to every body may not be ſo plain. Firſt then, the cauſes why ſome *Echo's* return more, and ſome fewer ſyllables, I take to lye in the different diſtances of the objects (returning the voices) from the places of the ſpeakers: for by experience 'tis found, that if the ſpeaker be too near the object, the return is made ſo quick upon him, that the *Echo* is as it were drowned in the voice: but if he remove farther from it, then it begins to be clear and diſtinct; and if it be a *polyſyllabical* one, it firſt repeats one ſyllable, then two, three, four, five, or more, according as the ſpeaker removes farther off it, which I take to be the only true way of meaſuring the proportions of the ſpaces of the ground, requiſite for the return of one or more ſyllables. That this is true, I ſhall uſe no arguments to perſwade, becauſe the experiment is ſubject to every mans tryal; and if ſo, it muſt neceſſarily be admitted, that the reaſon why this *Echo* returns ſo much, is becauſe of the great diſtance of the object from the ſpeaker.

17. What diſtance is required to the return of each ſyllable, is beſt indeed determined by ſuch a procedure, where the object is fore-known, and the condition of the place will admit of the experiment: but both theſe being wanting here (*Echo*'s themſelves being generally firſt known, and not the objects) I was forced to make uſe of a new *analytical* method, and find out the object by the number of ſyllables already returned, which being ſeventeen in the day time, and twenty by night; and having before found by frequent experience, that according to *Blancanus* [s], no one ſyllable will be returned clearly, under the diſtance of 24

[s] *Blancani Echometria Theorem* 5.

Geome-

Geometrical paces, or 120 feet, I gueſs'd that the object could not be removed leſs than 400 of the former, and 2000 of the latter. For the better underſtanding of which *Analyſis*, and for the Readers more ſecure finding of the true diſtance of the ſpeaker in any other place, it may be convenient that he take notice, that all *Echo's* have ſome one place whither they are returned ſtronger, and more diſtinct than any other, and is always the place that lies at right angles with the object, and is not too near, or too far off: for if a man ſtand at oblique angles with it, the voice is better returned to ſome other perſon at another place, than to the ſpeaker; and ſo if he ſtand too near, or far off, although he do ſtand at right angles with it, which is plain by the *diagram*, *Tab.* 1. *Fig.* 3. where

a. *is the true place of the ſpeaker.*
a b. *the vocal line falling at right angles on the object.*
c d. *places on each hand the true place, and oblique to the object.*
e f. *places above and below the object, whence alſo the voice comes obliquely to it.*
g h. *places whence ('tis true) the voice goes in right angles to the object, but* g *is too far off, and* h *too near.*

Now the ſpeaker ſtanding in *a*, and his voice going in the ſtraight line *a b*, and ſtriking upon the object ſo as to make right angles with it, muſt needs return to the ſpeaker again in the ſame line, and no farther, becauſe he is ſuppos'd to ſtand at the two extreams of the whole mix'd line of action: but if he ſtand too near at *h*, then the *Echo* repeats more ſyllables, and diſtincter at *g* than either at *h* or *a*, becauſe *g* is now the extream of the line of action; for by how much the nearer the ſpeaker is to the object, by ſo much the more forcible he ſtrikes it, which cauſes the rebound to be ſo much beyond him: and thus if he ſtand as much too far off, as at *g*, then the *Echo* repeats more ſyllables and diſtincter at *h*, then either at *a* or *g*, becauſe the diſtance being too great from *g* to *b*, and the reflexion weak, the *Echo* muſt needs terminate ſo much the ſhorter at *h*; all theſe being ſuppoſed to take up the whole line of the voices direct and reflex action. Again, if the ſpeaker ſtand in *c* obliquely to the object, the *Echo* is better heard at *d*, than either at *a* or *c*; and ſo if he ſtand at *d*, it is better heard at *c* then any other place: thus if he ſtand at *e*

above the object, the *Echo* is beſt heard in the valley *ſ, & vice verſâ.* All which, may be well enough made out by throwing a ball againſt a wall, to which, if it be thrown in an oblique line, it returns not to the thrower but to another place; and though the projicient do ſo throw it, that it ſtrikes at right angles with the wall, yet (like as in the voice) if he ſtand too far off, it will fall as much too ſhort in the rebound, as it will exceed if he ſtand too near.

18. According to theſe grounds I carefully examined this *Echo*, and found, upon motion backward, forward, and to each hand, the true *centrum phonicum*, or place of the ſpeaker, to be upon the hill at *Woodſtock* towns end, about thirty paces below the corner of the wall aforeſaid, directly down toward the *Kings Majeſties* Manor: from whence by meaſure to the brow of the hill, on which my Lord *Rocheſters* Lodge ſtands, are 456 Geometrical paces, or 2280 feet; which upon allowance of 24 Geometrical paces, or 120 feet to each ſyllable, to my great ſatisfaction I found to be agreeable to the return of 19 ſyllables, *viz.* one fewer than it returns in the night, and two more than in the day.

19. The meaſure I muſt confeſs had been much more eaſie and natural, could I have began from the object, and ſo removed backward accordingly as the *Echo* gradually increaſed in the repetition of more ſyllables; for then I could have given the due proportion to each, if I had found any inequality upon the increaſe, which I gueſs there may be, becauſe the allowance of an equality ſeems to ſet the object too far off by a ſyllable or two. But it not being feaſible in this place, I was forced to take the former courſe; for in the valley between the two hills, being the whole *medium* through which the voice paſſes, and the *Echo* returns it, there is ſcarce any ſuch thing as an *Echo* to be found; nay, if you ſtand at the Manor it ſelf, which is not far from the true place of the ſpeaker, and ſituate almoſt as high, and direct your voice toward the place of the object, you ſhall not have the leaſt return; whence 'tis moſt evident that I could not uſe that procedure here, and therefore muſt deſire to be held excuſed from giving the proportions of ſpace, which I ſuppoſe, according to *Kircher*[t] may decreaſe, according as the number of ſyl-

[t] *Magia Phonocamptica, probl.* 5.

lables

lables increaſe, till I meet with an *Echo* fit for the purpoſe.

20. The reaſon of the difference between day and night, why it ſhould return ſeventeen ſyllables in the one, and twenty in the other, may lie, I ſuppoſe, in the various qualities, and conſtitution of the *medium* in different ſeaſons; the Air being much more quiet, and ſtock'd with exhalations in the night than day, which ſomthing retarding the quick motion of the voice to the object, and its return to the ſpeaker ſomwhat more, (by reaſon the voice muſt needs be weakned in the reflexion) muſt neceſſarily give ſpace for the return of more ſyllables.

21. Amongſt other tryals of this *Echo*, I diſcharged a Piſtol, which made a return much quicker then my voice, and (at which I ſtill wonder) with a much different ſound from that the Piſtol made, whence I can only conclude, that the more forcibly the Air is ſtricken, (as alſo in the projection of a ball) the ſooner the reſponſe is made, and that poſſibly there may be ſome ſounds more agreeable to every *Echo*, than others. And it being my Lord *Bacon*'s opinion, That there are ſome letters that an *Echo* will hardly expreſs, and particularly the letter S, which, ſaies he, being of an interior and hiſſing ſound, the *Echo* at *Pont Charenton* would not return [u]; hereupon I tryed, as well as his Lordſhip, with the word *Satan*, beſide many others of the ſame initial, but found the *Echo* here neither ſo modeſt or frighted, but that, though the Devil has been buſie enough hereabout (as ſhall further be ſhewn near the end of this Hiſtory) it would readily enough make uſe of his name.

22. Juſt ſuch another *polyſyllabical Echo* we have at *Magdalen College*, in the water-walks, near the Bull-work called *Dover Peer*; it repeats a whole *Hexameter* verſe, but not ſo ſtrongly as *Woodſtock*: Where the true object of this may be, cannot ſo well be found by meaſure, becauſe of the many Buildings interpoſing; but I conjecture it may be about the publick Schools, or *New College* *. I could gladly, I confeſs, have aſſigned it ſomthing further off, becauſe I fear that diſtance falls ſomwhat ſhort of our former account, but the buildings beyond lying all lower then thoſe, it muſt by no means be admitted; which makes me think, there muſt be a latitude allowed in theſe matters, according to the

[u] *Nat. Hiſt. Cent.* 3. *Numb.* 251. * *Since*, New College *hath been advanced a Story higher*, A. D. 1675. *this* Echo *is ſomwhat alter'd.*

different circumſtances perhaps of time, as well as place; and that poſſibly *Merſennus* might not be ſo much miſtaken, when he aſſigned to each ſyllable but 69 feet.

23. *Tonical Echo's*, ſuch as return but ſome one particular Muſical Note, I have met with ſeveral, and do not doubt but they are to be met with in moſt arched Buildings, though ſcarce obſerved or noted by any. Such a one is that in the Gate-houſe at *Braſen-noſe College*, which anſwers to no Note ſo clearly, as to *Gamut*. The curious and well built Gate of *Univerſity College*, to none ſo well as *B mi*. The like Note I met with again at *Merton College*, in the Vault between the old and new Quadrangles, and in the large arched Vault of *Queens College* Gate: Whereas the ſtately arched Stair-caſe leading into *Chriſt Church* great Hall, will return all the Notes through the Scale of Muſick. Theſe I muſt confeſs are but *Echo's* improperly ſo called, becauſe they will expreſs nothing that's articulate, and therefore rather fall under the notation of a *Bombus*; yet their cauſe being ſomwhat nice and ſubtile, I thought not fit to paſs them by, but to take occaſion from hence to advertiſe the Reader, that there are ſome other inanimate Bodies beſide the *Load-ſtone*, that though they have no ſenſe, yet have a ſort of perception, which I take to be ſufficiently proved from theſe Vaults, that ſeem to have a kind of election to embrace what is agreeable, and exclude all that is ingrate to them: thus are the very ſeats in Churches and Chappels affected with ſome peculiar Notes of the *Organ*; and I have a friend (a Violiſt) whom I dare believe, that ſays, his Thigh is thus ſenſible of a peculiar Note, as oft as he lights on it during his playing. Some have imputed much of this in Buildings, to the figure and accurate ſtructure of the Arch, and that where they have different ſhapes and magnitudes, there will be different tunings alſo: But I do not find it agreeable to experience, there being another Vault in the entrance into *Merton College* Chappel, much leſs, and of a far different figure from that other before mentioned in the ſame *College*, which returns very near, if not exactly the ſame Note: And ſo do the Gates of *Queens* and *Univerſity Colleges*, than which in height, breadth and length, there are few more different.

24. It muſt therefore rather be referr'd to the pores of the ſtones, which are fitted to receive ſome vibrations of the Air, rather

rather than others; juſt as in two Viols tuned to a *Uniſon*, where the ſtrings being ſcrewed to the ſame tenſion, and their pores put into the ſame figure, if you ſtrike one, the correſponding ſtring of the other Viol preſently anſwers it: becauſe the firſt ſtring being of ſuch a tenſion, and having pores of ſuch a form, makes vibrations in the Air, ſuitable only to the pores made by the ſame tenſion in the other ſtring.

25. As for *Tautological Polyphonous Echo's*, ſuch as return a word or more, often repeated from divers objects by ſimple reflection, there are none here eminent; the beſt I have met with is at *Ewelme*, on the ſide of a bank, in a Meddow ſouth and by weſt (about a furlong) from the *Church*: it returns the ſame word three times, from three ſeveral objects of divers diſtances, which I gueſs may be, 1. The *Manor*, 2. The *Church* and *Hoſpital*, And 3d. Colonel *Martins* houſe. Another there is near *Oxford*, about the eaſt-end of *Chriſt Church* new walk, that repeats three or four ſyllables twice over; and a treble one at the moſt northern point of the Fortifications in *New Parks*: But there being many better than theſe of the kind no doubt in other places, I ſhall reſerve their conſideration at large to a better opportunity, and only take notice here by the way, that theſe are never of many ſyllables; and that always, by how many more they are of, by ſo many the fewer times they repeat them, becauſe ſo great diſtance will be required for their objects, that they muſt quickly be removed out of the reflex action of the voice: for ſuppoſe but a ſentence of ten ſyllables, *viz.* *Gemitu nemus omne remugit*, and allow, as before, for the return of each ſyllable 120 feet, the firſt object muſt be 1200 feet off; and the ſecond, with abatement for diſtance, at leaſt 2000; and the third, certainly out of the voices reach, beyond all hopes of any reſponſe. Indeed, could we meet with one of *Merſennus*'s *Echo's*, where ſixty nine feet would return us a ſyllable, then ſuch an *Hemiſtick* might be reſounded three times, or perhaps a whole *Hexameter* twice; yet however ſmall a ſpace may be found for the clear repetition of ſuch a Verſe, I cannot think it can poſſibly be, that any *Echo* ſhould repeat one eight times over: for ſuppoſe a ſmaller diſtance would ſuffice, then that allowed by *Merſennus*, as but 350 yards to a Verſe of ſeventeen ſyllables, and allowing ſome decreaſe for the objects diſtances; yet I do not doubt, but two or

three

three of the furtheſt muſt needs be out of the voices action.

26. Much leſs ſure can any ſingle object perform this, and yet *Jacobus Boiſſardus*, in his *Topography* of *Rome*, reports this to be true upon his own knowledge. *On the* Appian *way* (ſaies he) *amongſt many other vaſt ruins, which ſome think to have been the Caſtle wherein the* Prætorian *Soldiers lay, there are many Sepulchers, obtuſe and ſolid* Pyramids, *&c. But the moſt eminent is of a round form, made of ſquared white Marble, like a Tower, hollow within and open at the top, erected in memory of* Cæcilia Metella: *it ſtands in the corner of another wall, in whoſe circuit there are carved in Marble, near* 200 *Bulls heads, whence 'tis called,* Capo di Boi. *At the foot of the hill where this Tower ſtands, if any man pronounce an* Heroic *Verſe, a wonderful* Echo *there is, that returns it often entirely and articulately: I my ſelf,* ſays he, *have heard it repeat the firſt Verſe of* Virgils Æneids *diſtinctly eight times, and afterward often broken and confuſedly. No place in the World yields the like* Echo [w], *&c.* And what if I add, *nor that neither,* ſince beſide the natural impoſſibility of the thing, the induſtrious *Kircher*, after he had uſed all imaginable care in the queſt of it, came away unſucceſsful, and found no ſuch matter [*].

27. But though we have no conſiderable *Tautological Echo's*, by a ſimple reflection, yet we have others of no inferior account made by a double one, which alſo ariſing from divers objects, though in a different manner, belong to this place. Of theſe, though there are ſcarce any that will return a *Triſſyllable*, occaſioned, I ſuppoſe, by the nearneſs of the ſecondary objects, yet a clap with the hands or ſtamp of the feet, there are ſome will return eight, nine, or ten times, the noiſe dying, as it were, and melting away by degrees with ſuch a trembling noiſe, that I ſomtime thought of the Epithet [*tremulous*] to diſcriminate this ſort of *Echo* from the reſt.

28. At *Heddington*, in the Garden of one M^r *Pawling* Mercer of *Oxon:* there is a wall of about 40 yards long, built for the advantage of the Fruit, with divers *Niches*; to which, if you ſtand but a little obliquely, ſo as to ſee the *Peers* ſtanding out between each two of them, you have the ſeveral objects of ſuch an *Echo*, not above nine or ten foot diſtant from each other, which return a clap with the hand, or a *monoſyllable* (the wind being

[w] *Jani Jacob. Boiſardi, Topographia Romæ, p.* 65, 66. [*] *Magiæ Phonocampticæ, Præluſ.* 2.

quiet

quiet and ſtill) at leaſt nine, if not ten or eleven times, but ſo thick and cloſe, that even a *diſſyllable* breeds a confuſion: Where by the way if it be objected, that (the whole wall being but 40 yards, or 120 foot long) according to the afore-limited diſtance for *Echo's*, a *monoſyllable* ſhould not be returned above once at moſt: It is to be noted, that theſe *Echo's* made by a double reflection, begin (quite contrary to all others) at the remoteſt object from the *corpus ſonorum*, which in as many as I have yet ſeen, is a diſtinct wall, falling on that; on which the reſt of the objects are, in right angles; and this object it is, that firſt terminates the voice, clap, or ſtamp; and from which, by reflection, they next ſtrike the *ultimate* ſecondary object, then the *penultimate* and *antepenultimate*; which, though nearer to the *corpus ſonorum* in reſpect of the ſituation of the objects, yet are ſtill further off in reſpect of the voice, or other ſounds motion: whence it comes to paſs, that the neareſt object to the *corpus ſonorum* is laſt ſtricken, and therefore repeats a ſyllable as well as any of the reſt, becauſe indeed in that reſpect the furtheſt from it.

29. After the voice or clap has ſtricken theſe ſecondary objects, by way of acceſſion as it were to the *corpus ſonorum*, it is carryed again by a ſecond reflection away from it toward the primary object, and ſomtimes over it, as it appears to be in this *Echo* at *Heddington*, where the ſound ſeems as it were ſomwhat refracted, for it is heard quite out of the place, as is evident to any one that ſtands in the *North-eaſt* corner of the Garden and ſpeaks *Weſtwards*, who will hear the *Echo* rather in the Hortyard on the other ſide the wall, than in the Garden, which I take moſt certainly to be occaſioned by this ſecond reflection; for let any one that ſuſpects the *Echo* to be really in the Hortyard, and not in the Garden, go but into it, and he ſhall there find no ſuch matter as an *Echo*. All which, is more ſenſibly explained in *Tab.* 1. *Fig.* 4. where

a. *is the place of the ſpeaker or maker of any other ſound.*

b. *the primary object firſt terminating the ſound, and reflecting it on the* Peers *of the other wall.*

c c c c c c. *the* Peers *between every two* Niches *that receive the ſound reflected from the primary object and make the* Echo.

d d d d d d. *the lines wherein the voice is carryed back again over the primary object, whereby the* Echo *appears out of its place.*

But

But herein let it be noted, that I am not ſo ſanguine as to exclude all fears that it may be otherwiſe, but only ſuggeſt what ſeems moſt probable at preſent, *cum animo revocandi*, whenever I ſhall be better informed by another, or my own future experience.

30. At *New College* in the Cloyſters, there are others of this kind, to be heard indeed on all ſides, but beſt on the *South* and *Weſt*, becauſe on thoſe there are no doors either to interrupt or waſt the ſound: Theſe return a ſtamp or voice, ſeven, eight, or nine times, which ſo plainly is occaſion'd by the *Peers* between the windows, that on the *Weſt* and ſhorter ſide (being but 38 yards long) the returns are more quick and thicker by much than on the *South*, where the primary object being above fifty yards removed from the *corpus ſonorum*, and the ſecondary ones proportionably further; the returns are much ſlower and more diſtinct, in ſo much that on that ſide the *Echo* will return a *diſſyllable*, whereas on the *Weſt* ſide you can have but a *monoſyllable* only. If it be objected, that according to the rule, 38 yards are not enough for the return of a *monoſyllable*; I anſwer, that though it may be likely enough that the return of the primary object on that ſide is not heard, yet that there is none of the ſecondary ones, or *Peers* between the windows, but what are diſtant from the ſpeaker above 40 yards, and therefore may well return a *monoſyllable*. And if again it be objected, that the *interval* of an *Echo* muſt be *liberum* and *patens* *, and it be further demanded how it comes about that we have ſuch *Echo's* in Cloyſters, when we can have none in wells that are cover'd with houſes, becauſe the *interval* is cloſed at both ends, as this Cloyſter is: It muſt be anſwered, that that rule holds only in narrow *intervals* cloſed up on all ſides, and not in ſuch Cloyſters that are open and arched to the top; Which may alſo be the reaſon why at *Magdalen College*, where the Cloyſters are covered with a flat roof, they have but an inconſiderable *Echo*, and at *Corpus Chriſti* none at all; notwithſtanding they have all other conditions requiſite.

31. In the Cloyſter at *All-ſouls College*, in the *North* and *Weſt* ſides, where no doors hinder, there is much ſuch another, which to the ſtamp of ones foot, or clap with the hands, anſwers four or five times, with a noiſe not unlike the ſhaking of a door, and in nothing differing from the former, but that to the voice it

* *Blancani Echometria, Theoremate*, 4.

makes

TAB. I

ad pag. 16

fig 1.

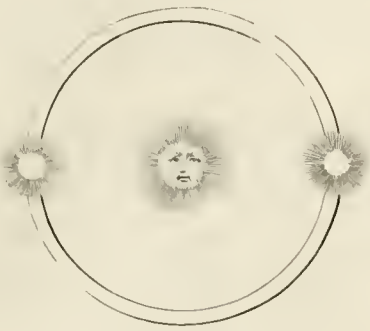


fig 3

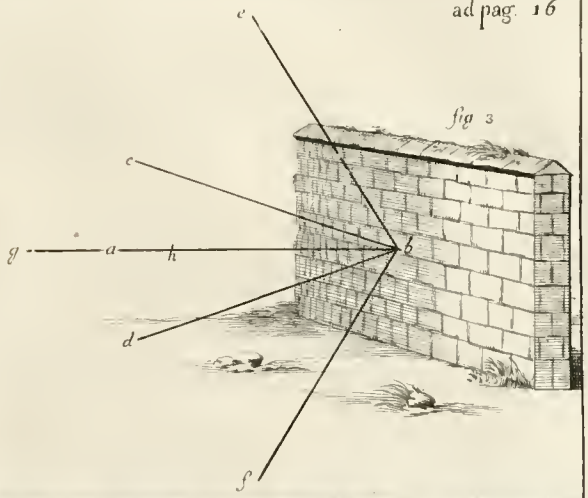
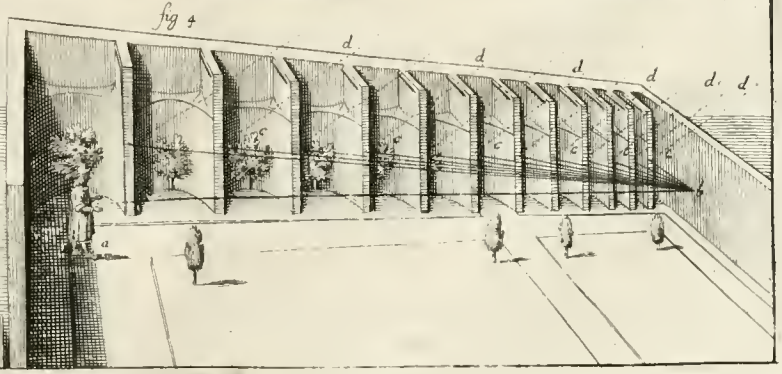


fig 2

fig 4



makes no reſponſe * : and indeed, it would be matter of wonder if it ſhould, ſince no one ſide of that Cloyſter comes near the diſtance aſſigned for the return of a ſyllable, whereas that at *Heddington* juſt equals it, and one ſide of *New College* much exceeds it.

32. Other *Echo's* there be that belong to this place, as *Echo's* upon *Echo's*, and ſuch as my Lord *Verulam*[y] ſtiles *back-Echo's*; of which, becauſe I have met with none conſiderable, I am content to paſs them by, having ſufficiently, as I ſuppoſe, by this time tired the Readers patience with too tedious a conſideration of ſo particular a ſubject, and make haſte to treat of the *Air* of *Oxford-ſhire*, as it ſtands in reference to Sickneſs or Health. But all *Air* of it ſelf being equally pure, and only accidentally good or bad, accordingly as more or leſs filled with wholſom or noxious vapors aſcending from the Waters, or moiſt Earths; I refer its conſideration to the next *Chapter*, to which it ſeems more intimately and originally to belong: it being the opinion of *Hippocrates*, and on all hands agreed, That *Waters* are of much more concernment in reference to health than the *Air* can be, becauſe they are as it were part of our aliment, and the *Air* not ſo; and may be of themſelves fundamentally bad, whereas the *Air* is only ſo by participation.

* *There is much ſuch another as this, in the Ball-Court at* Corpus Chriſti Coll. [y] *Nat. Hiſt. Cent.* 3. *Num.* 249, 250.

CHAP. II.

Of the Waters.

THAT *Oxford-ſhire* is the beſt *water'd County* in *England*, though I dare not with too much confidence aſſert, yet am induced to believe there are few better; ſince beſide the five more conſiderable Rivers of *Thame*, *Iſis*, *Cherwell*, *Evenlode*, and *Windruſh*, there are numbred no leſs than threeſcore and ten at leaſt of an inferior rank, beſide ſmaller Brooks not worthy notice: And all theſe of ſo quick a ſtream, and free from ſtagnation, ſo clear, and yet ſo well impregnated with wholſom primogenial Steams of *Salts* and *Sulphurs*, that few (if any) vappid and ſtinking Exhalations can aſcend from them to corrupt the *Air*. As for ſtanding Pools, Mariſh, or Boggy grounds, the parents (at leaſt occaſions) of *Agues*, *Coughs*, *Catarhs*, they are feweſt here of any place to be found: the Soyl for the moſt part lying dry, and water'd only with clear and rapid Fountains. In ſhort, ſo altogether agreeable is this County to *Cardans* [2] rule, *Solum ſiccum cum aquis currentibus ſalubritatem Aeris efficiunt*, that had he wanted an inſtance for confirmation, he might have found one here moſt ſuitable to his purpoſe. And if plenty of wholſom Fiſh, ſpontaneous productions of odoriferous Plants, and the ſcarcity of filthy *Reptils*, be cogent Arguments of the goodneſs of *Waters*, Soyls, and conſequently of *Air*, as heretofore they have been accounted, I know not the place can make better pretences, as ſhall be ſhewn more at large in their proper places.

2. Beſide its clearneſs from peſtiferous vapors, I take the ſharpneſs we find this *Air* to be of, to be no ſmall argument of its health and purity. *Ariſtotle*, 'tis true, thought *Air* moderately warm, but its conſtant return to a brisk coldneſs, after it has been heated either by fire, the Sun, or warm exhalations, gives us ſtrong ſuſpitions that 'tis naturally cold: All natural Bodies, after they have ſuffered violence, returning of themſelves to their innate condition. To which add, that the *Air* on the tops of high Mountains, above the reach of the Clouds and other warm Exhalations, as 'tis found to be clear, ſo 'tis very

[2] *Comment. in Hippoc. de Aere, aquis, & locis.*

cold;

cold; whence I think it may not be *illogically* concluded, That the colder the *Air*, the nearer to purity, and consequentially more healthy: Which is also very suitable to the doctrine of *Hippocrates*, who speaking concerning the healthy situation of Cities, says, *That such which are placed to cold winds,* [a] πρῶτον μὲν τὰ ὕδατα τὰ σκληρότατε καὶ ψυχρά, ὡς ὅτι τὸ πλῆθος γλυκαίνεται ----- τὰς δὲ κεφαλὰς ὑγιεινὰς, καὶ σκληρὰς. i. e. *that though their Waters are harsh and cold, yet for the most part they are sweet, and the Inhabitants healthy and brisk, sound, and free from defluxions.* And so indeed in the main I find them here, of a very chearful humor, affable, and courteous in their Deportment; neither sparing, nor profuse in their Entertainments, but of a generous temper, suitable to the sweet and healthful *Air* they live in: Whereas the *Inhabitants of fenny and boggy Countries, whose Spirits are clogg'd with perpetual* Exhalations, *are generally of a more stupid, and unpleasant conversation.*

3. That the qualities of *Waters* and Soyls, together with the situations of places to the respective Quarters of the World, make them more or less healthy, according to the great [b] *Hippocrates*, there is no doubt. But to these I must beg the favor of adding, not only more swasive but more irrefragable proof; I mean, the great age and constant health of persons that have been lately, and are now living here: *Richard Clifford*, not long since of *Bolscot* in this *County*, died at 114 years of age: *Brian Stephens*, born at *Cherlbury*, but Inhabitant of *Woodstock*, dyed last year at 103. Where also there now lives one *George Green* (but born at *Ensham*) in his hundredth year: at *Kidlington* one M^ris *Hill* was born, and lived there above an hundred years: and at *Oxford* there is living, beside several near it, a Woman (commonly called *Mother George*) now in her hundredth year current. The pleasant situation of which City is such, and so answerable to the great Reputation it ever had in this respect, that it must not by any means be past by in silence.

4. Seated it is on a rising Ground, in the midst of a pleasant and fruitful Valley of a large extent, at the confluence, and extended between the two Rivers of *Isis* and *Cherwell*, with which it is encompass'd on the *East*, *West*, and *South*; as also, with a ridge of Hills at a miles (or somwhat more) distance, in the form

[a] *Hippocr.* περὶ ἀέρων, ὑδάτων τόπων. [b] *Id. ibid.*

of a Bow, touching more then the *Eaſt* and *Weſt* points with the ends, ſo that the whole lies in form of a *Theater*: In the *Area* ſtands the City mounted on a ſmall hill, adorned with ſo many *Towers*, *Spires* and *Pinnacles*, and the ſides of the neighboring Hills ſo ſprinkled with Trees and *Villa's*, that no place I have yet ſeen has equall'd the Proſpect *. 'Twas the ſweetneſs and commodiouſneſs of the place, that (no queſtion) firſt invited *the great and judicious King Alfred*, to ſelect it for *The Muſes Seat*; and the Kings of *England* ever ſince (eſpecially when at any time forc'd from *London* by *War*, *Plague*, or other inconveniencies) ſo frequently to remove hither, not only their *Royal Courts*, but the *Houſes of Parliament*, and *Courts of Judicature*: Many *Synods* and *Convocations* of the *Clergy* have been alſo for the ſame reaſon held here; of which, as they have promiſcuouſly happened in order of time, take the following *Catalogue*.

A Catalogue of Parliaments, Councils, and Terms that have been held at *Oxford*.

A Parliament held at Oxford, *in the time of King* Ethelred, *anno* 1002.

A Parliament at Oxford, *under King* Canutus, *an.* 1018.

A Parliament at Oxford, *under King* Harold Harefoot, *anno* 1036.

A Conference at Oxford, *under King* William Rufus, *an.* 1088.

A Conference at Oxford, *in the time of King* Stephen.

A Council at Oxford, *held againſt the* Waldenſes, temp. Hen. 2. *an.* 1160.

A Council at Oxford, *under King* Hen. 2. temp. Tho. Becket Archiep. Cant. *an.* 1166.

A general Council at Oxford, *at which King* Hen. 2. *made his Son* John *King of* Ireland, *an.* 1177.

A Parliament at Oxford, *called* Parliamentum magnum, temp. H. 2. *an.* 1185.

A Council at Oxford, temp. Rich. 1.

A Conference at Oxford, *in the time of King* John.

* *Ab amœnitate ſitus* Belloſitum *dictum.*

A Parliament held at Oxford, temp. Hen. 3. *an.* 1218. *which first gave occasion to the* Barons *Wars.*

A Council at Oxford, *under* Steph. Langton *Arch-Bishop of* Canterbury, *an.* 1222.

A Council at Oxford, *an.* 1227.

A Council at Oxford, *under* Stephen *Arch-Bishop of* Canterbury, *and his Suffragans, an.* 1230. 14 Hen. 3.

A Council at Oxford, temp. Hen. 3. *an.* 1233.

A Council at Oxford, *under* Edmund *Arch-Bishop of* Cant.

A Council held at Oxford, *by the Bishops*, temp. Hen. 3. *an.* 1241.

A Term kept at Oxford, 31 Hen. 3.

A Council at Oxford, temp. Hen. 3. *an.* 1247.

A Council held by the Bishops at Oxford, *an.* 1250.

A Parliament held at Oxford, *called* Parliamentum insanum, 41 Hen. 3.

A Council at Oxford, *an.* 1258.

A Parliament at Oxford, *an.* 1261.

A Parliament at Oxford, *an.* 1264.

A Council at Oxford, *under* John Peckham *Arch-Bishop of* Canterbury, *an.* 1271.

A Council held at Oxford, *under* Robert Winchilsea *Arch-Bishop of* Canterbury, *an.* 1290.

A Parliament summon'd at Oxford, 4 Edw. 3.

A Parliament at Oxford, 19 Novemb. *an.* 1382.

A Parliament at Oxford, 6 Rich. 2.

A Term kept at Oxford, 11 Rich. 2.

A Term kept at Oxford, 16 Rich. 2.

A Convocation of the Clergy *at* Oxford, *by* Tho. Arundel *Arch-Bishop of* Canterbury, *an.* 1395.

A Parliament at Oxford, 1 Car. 1. 1625.

A Parliament summon'd at Oxford, temp. Car. 1. *an.* 1644. *The Terms kept at* Oxford, eodem temp. *it being the* Kings *Head-Quarters in the late Civil War.*

A Parliament at Oxford, 13 Car. 2. *an.* 1665.

The Term kept at Oxford, eodem temp. *the Plague being then at* London.

5. Of theſe there is an imperfect Liſt in a MSS. [c] in *Corpus Chriſti College* Library *Oxon.* in which there are alſo mentioned three *Synods* held in St. *Maries* Church: A *Provincial Chapter* of the *Fryars* Preachers, and a *Council* held at *Oxon.* whoſe Votes were written by *Abraham Woodhall.* There is alſo a *Provincial Council* at *Oxford*, mention'd in the Catalogue ſet before the Decrees of *Gratian.* But theſe bearing no date, and in all likelyhood the ſame with ſome of the afore-mentioned; I paſs on to another *Parliament*, which though not at *Oxford*, yet was held in this *County*, and therefore I ſuppoſe not improper for this place. However, I ſhall rather venture the danger of impropriety and miſplacing, then omit the taking notice of ſo conſiderable a *Meeting*, it being the firſt *Parliament* held in the *County*, and doubtleſs in *England*; called it was at *Shifford*, now a ſmall Village in the Pariſh of *Bampton*, and ſhewing now nothing adequate to ſo great an *Aſſembly.*

6. There is a MSS. in Sir *Robert Cottons* Library, that gives an account of this *Parliament*, which, it ſaies, conſiſted of the chief of all Orders of the Kingdom, and was called at *Sifford* (now *Shifford*) in *Oxford-ſhire*, by King *Alfred*, where the *King* as Head conſulted with the *Clergy*, *Nobles*, and others, about the maners and government of the people, where he delivered ſome grave admonitions concerning the ſame: The words of the MSS. are theſe,

Æt Sipforo ſeten Danep manie, ⁊ele Biſcopſ, eꝛ ⁊ele Boclepeo, Eꝛleſ ꝑꝑuꝺe, eꝛ Cnihteſ egloche:· Þep paſ Eꝛle Elꝑꝑicoꝑ Þelage ⁊muꝺh ꝑiꝛe, ⁊ ec Ælꝑꝑeo Engleliꝑo, Engle ꝺeꝑling, on Englanꝺ he paſ Cyng, hem he gan lepen, ⁊ꝛo hi hepen mihten hu hi hepe liꝑ leꝺen ⁊colꝺen.

i. e. *There ſate at* Shifford *many* Thanes, *many Biſhops, and many learned Men, wiſe Earls, and awful Knights: there was Earl* Elfrick *very learned in the Law, and* Alfred, Englands *Herdſ-man*, Englands *Darling*; *he was King of* England, *he taught them that could hear him how they ſhould live.*

7. To which perhaps may be added, the great *Council* of *Kyrtlington* held there not long after, in *an.* 977, at which were preſent King *Edward* the Martyr, and S[t] *Dunſtan* Arch-Biſhop of *Canterbury*; and at which died *Sidemannus* Biſhop of *Crediton.* This Council by Sir *Henry Spelman* [d] is taken to be the ſame mentioned by *Wigornienſis* held at *Kyrtlinege*, which he gueſſes to be

[c] *MSS. fol. C. p.* 173. [d] H. Spelman *Concil. Tom.* 1. *An.* 977. *p.* 493.

now

now *Katlage* in *Cambridge-ſhire*; but I rather believe it was held here, not only for the ſake of the name, which remains the ſame to this day, but becauſe of the one and only Conſtitution made there, *viz. That it ſhould be lawful for the Country People to go in Pilgrimage to St.* Mary *of* Abington; a thing in all likelyhood not ſo deſirable to the People of *Cambridge-ſhire*, as to ours of *Oxford-ſhire* ſo near the place: Beſide, the great reputation that this place was of in ancient times, ſeems to juſtifie my plea, it enjoying as great Privileges, and perhaps being a fitter place in thoſe days for the reception of ſuch an Aſſembly, then *Oxford* it ſelf; for I find it part of the Poſſeſſions of the Kings of *England*, from whom it came to *Henry*, Son of *Edmund Crouchback* Earl of *Lancaſter*, and Father to *Henry*, the firſt Duke of *Lancaſter*, by whoſe Daughter and ſole Heir *Blanch*, it came to *John* of *Gaunt* Duke of *Aquitane* and *Lancaſter*, and was free, a *Thelonio, paſſagio, laſtagio, pacagio, ſtallagio, tallagio, tollagio, cariagio, & terragio, per totum Regnum*, as I find it in an old Charter in the poſſeſſion of the Right Worſhipful Sir *Tho: Chamberleyne*, now Lord of the Town, whoſe ſingular civilities in imparting this, and ſome other matters hereafter to be mention'd, I cannot but in gratitude ever acknowledge.

8. From whence (after ſo long, but I hope not unpleaſant digreſſion) I return to the Beautiful *Oxford* again, a place of ſo ſweet and wholſom an *Air*, that though it muſt not be compared with that of *Montpellier*, yet upon my own knowledge it has proved ſo advantagious to ſome, that it has perfectly recovered them of deep Conſumptions; and particularly a worthy Friend of mine, who though he came hither ſufficiently ſpent, yet without the help of any other *Phyſick*, within few *Months* felt a ſenſible amendment; and in fewer *Years* became of as ſanguine a complexion as the reſt of his friends, that had almoſt deſpaired of him.

9. Some have thought the *Small Pox* here more then ordinarily frequent, and it muſt indeed be confeſt, That we are perhaps as often, though not ſo ſeverely infeſted as ſome other places; for generally here they are ſo favorable and kind, that be the Nurſe but tolerably good, the Patient ſeldom miſcarries. But admit the Objection be truly made, That it is more ſubject to the *Small Pox* than other neighboring Cities about, yet if by ſo much

much the leſs it feel the rage of the *Plague*, I think the edge of the charge is ſufficiently rebated. 'Tis reported amongſt the [e] obſervations of an ingenious Perſon that reſided long in the Iſland *Japan*, That though the Air be very ſalubrious there, yet the *Small Pox* and *Fluxes* are very frequent, but the *Plague* not ſo much as ever heard of; which has often made me reflect on the year 1665, when the *Peſtilence* was ſpread in a maner all over the Kingdom, that even then, though the Court, both Houſes of Parliament, and the Term were kept at *Oxford*, the *Plague* notwithſtanding was not there at all.

10. Others again, tell us of the *Black Aſſiſe* held in the Caſtle here, *an.* 1577. when a *poyſonous ſteam* broke forth of the Earth, and ſo mortally ſeiſed the ſpirits of the *Judges*, *Sheriffs*, *Juſtices*, *Gentry* and *Juries*, beſide great numbers of others that attended the buſineſs, that they ſickned upon it and almoſt all of them dyed: but let it not be aſcribed to ill *fumes* and *exhalations* aſcending from the Earth and poyſoning the Air, for ſuch would have equally affected the *Priſoners* as *Judges*, but we find not that they dyed otherwiſe then by the halter, which eaſily perſwades me to be of the mind of my [f] Lord *Verulam*, who attributes it wholly to the ſmell of the *Goal*, where the Priſoners had been long, cloſe, and naſtily kept.

11. 'Tis true, that *Oxford* was much more unhealthy heretofore then now it is, by reaſon the City was then much leſs, and the Scholars many more, who when crowded up in ſo narrow a ſpace, and the then ſlovenly Towns-men not keeping the ſtreet clean, but killing all maner of Cattle within the walls, did render the place much more unhealthy. Hence 'tis, that we find ſo many reſcripts of our Kings prohibiting *mactationem groſſarum beſtiarum infra muros, & quod vici mundentur à fimis & fimariis*, bearing date 13 *Hen.* 3. 29 *Edw.* 1. 12 *Edw.* 3. 37 *Hen.* 6.[g] and all alledging the reaſon, *quia per has mactationes, &c. aer ibidem inficitur*, becauſe by the killing ſuch maner of Cattle, and laying the dung in the ſtreets, the Air was infected. Moreover, about theſe times the *Iſis* and *Cherwell*, through the careleſneſs of the Towns-men, being filled with mud, and the Common-ſhoars by this means ſtopt, did cauſe the aſcent of *malignant* vapors whenever there happened to be a Flood; for beſide its ſtirring

[e] *Philoſoph. Tranſact. num.* 49. [f] *Nat. Hiſt. Cent.* 10. *num.* 914. [g] *MSS. in Arch. Bib. Bod. fol.* 90, 91.

the

the infectious mass, great part of the waters could not timely pass away, but stagnating in the lower Meddows, could not but increase the noxious putrid steams. But the former being long since remedyed by the care of the *University*, and the latter by the piety and charge of *Richard Fox* Bishop of *Winchester*, and Founder of C. C. C. *Oxon.* who in the year 1517. cleansed the Rivers, and cut more Trenches for the waters free passage [h]; the Town hath ever since continued in a healthful condition: though I cannot but believe, but were there yet more Trenches cut in some of the Meddows, the Air might be somwhat better'd still, especially during the Winter season, when I fear somtimes Floods stay a little too long, and that not only near *Oxford*, but in *Otmoor*; and all along the *Isis* from *Ensham* to *North-moor*, *Shifford*, *Chimly*, and *Rotcot*, which brings me again to the general consideration of the Waters as well of the whole County as City.

12. That the healthiness of *Waters* consists in their due impregnation with *Salts* and *Sulphurs*, and their continuance so, in their continual motion, is indisputably evinced from the stinking *evaporations* of them upon any *stagnation*. Now that the *Rivers* here abound with these, will be altogether as manifest as that they run, if we consider but the *Springs* they receive and *Earths* they wash. The *Isis*, 'tis true, till it comes to *New-bridge*, receives not (that I find) any eminently *salt* or *sulphureous waters*; but there it admits the *nitrous Windrush*, so well impregnated with that *abstersive salt*, that no place yields *Blanketing* so notoriously white, as is made at *Witney*, a Mercat Town on that River, and upon this account the most eminent in *England* for that kind of Trade; though I am not ignorant, that some add another cause joyntly contributing with the afore-mentioned, to the excellency of these *Blankets*; of which more at large when I come to treat of *Arts*.

13. Somwhat lower, about *Cassington*, it receives the *Evenlode*, a River whose Banks, especially near the Fountain heads, are very well saturated with both the *Minerals*: witness the waters that rise a little above Sir *Thomas Pennyston*'s, in the Parish of *Cornwell*, from a sort of Earth that may well pass for a *Marle*; and the *brinish Bog* near *Churchill*-mill, which though upon the surface of the ground seems to have no communication with the

[h] *Hist. & Antiq. Univers. Oxon. Lib.* 1. *pag.* 245.

adjoyning *Rivulet*, yet being ſo near, and the Glebe all thereabout being to be preſumed of a like nature, it muſt needs lick ſome of the *Mineral* in its paſſage. About *Kingham* I was told of a *ſulphureous* Earth, and that ſome of the *Waters* there were of ſuch an odour; but whether true or no, I am ſure on the other ſide the water, at a place called *Bould* in the Pariſh of *Idbury*, it is manifeſtly ſo; which being not far from the *River*, at leaſt not from the *Stream* that runs by *Foſcot*, and ſo into it, in all likelyhood may impart to the *waters* hereabout no mean quantity of its more *volatile* parts. Upon the *Cherwell* we have a *ſalt Spring* runs immediatly into it; and perhaps the *ſulphureous* Glebe of *Deddington* may ſomwhere reach the *River*. The Banks of the *Thame* are ſo well ſated with ſome kind of *acid*, that no well-water in the whole Town of the name, will either brew, or lather with ſoap: But none of theſe give a *tincture* ſo high, that they can be perceived by the moſt exquiſite palate, but only ſo far forth as may conduce to a due *fermentation*, and to keep them living: And yet without doubt from hence it is, that the *Thames* water at Sea, in eight months time, acquires ſo ſpirituous and active a quality, that upon opening ſome of the Cask, and holding the candle near the bung-hole, its ſteams have taken fire like Spirit of wine, and ſomtimes endanger'd firing the Ship[i]. Hence 'tis alſo that its ſtench is no abſolute corruption, and that after a third or fourth *fermentation*, it equals the waters of the Well in the Haven of *Brunduſium* *, and ſtinks no more; and though the Mariners are ſomtimes forced to drink it and hold their noſes, yet upon that account they do not ſicken; whereas all other *waters*, as far as has been hitherto obſerved, become irrecoverable upon ſtinking, and dangerous to drink.

14. *Cardan* in his Comment upon *Hippocrates*[k], takes the plenty and goodneſs of the Fiſh, to be a ſure indication of the wholſomneſs of *waters*. And our Country-man, the ingenious Dr *Browne* *, ſpeaking of the great fecundity of the River *Tibiſcus*, admits it into conſideration, whether its exceeding fertility may not be aſcribed to the *ſaline Tinctures* it receives from the natural *ſalt Mines* it licks by the way: which opinions if approved, as rationally they may be, ſhew the health of our waters and the

[i] *Philoſoph. Tranſact. Num.* 27. *pag.* 495. * *Plin. Nat. Hiſt. lib.* 2. *cap.* 103. [k] *De Aere Aquis & locis ſuper Text.* 3. * *General Deſcription of* Hungary, *pag.* 10.

reaſon

reaſon of it too: for though we muſt not compare our *Iſis* with *Tibiſcus* or *Brodrack*; the one whereof is ſaid to conſiſt of *two parts of water, and one of Fiſh*; and the other ſo repleniſh'd with them, that in Summer when the River is low, the People ſay, *The water ſmells of Fiſh:* yet in the year 1674. it gave ſo ample teſtimony of its great plenty, that in two days appointed for the Fiſhing of M^r^ Major and the Bayliffs of the City, it afforded betwixt *Swithins-Wear*, and *Woolvercot-bridge* (which I gueſs may be about three miles diſtant) *fifteen hundred* Jacks, beſide other Fiſh; which great fecundity, as it argues the goodneſs of the *Element*, ſo 'tis no whether to be referr'd, as to its original cauſe, but to the various *Salts* upon which depend the propagation of all ſorts of *Species*'s [l]; and as far as concerns this part of the *Animal Kingdom*, are plentifully to be found at the bottoms of ſome Rivers.

15. And I ſaid the rather at the bottoms of *Rivers*, not only becauſe Bodies from *Salts* have their ſolidity and weight [m], and therefore may well be preſumed to reſide in the loweſt places: but becauſe I find it the joynt agreement of all the *Water-men* hereabout that I have yet talk'd with, that the *congelation* of our *Rivers* is always begun at the bottom; which however ſurprizing it may ſeem to the Reader, is neither unintelligible nor yet ridiculous: for beſide matter of fact wherein they all conſent, *viz.* that they frequently meet the *Ice-meers* (for ſo they call the cakes of Ice thus coming from the bottom) in their very riſe, and ſomtimes in the under-ſide including ſtones and gravel brought with them *ab imo*, it ſeems upon conſideration alſo conſonant to reaſon: for that *congelations* come from the conflux of Salts, before diſpers'd at large, is as plain as the vulgar experiment of freezing a pot by the fire; and that induration and weight come alſo from thence, ſufficiently appears from the great quantities of them that are always found in ſtones, bones, *teſtaceous*, and all other weighty bodies [n]. Now whatever makes things compact and *ponderous*, muſt needs be indued with the ſame qualities it ſelf, and therefore affect ſuitable places; ſo that why ſtanding Pools ſhould freez at the top, might poſſibly have proved the greater difficulty of the two, had not the Learned D^r^ *Willis* already cleared the point, by ſhewing us, that all ſtanding waters are more or leſs in a ſtate of

[l] *Willis, de Ferment. cap. 2.* [m] *Willis de Ferment. cap. 2.* [n] *Willis de Ferment. cap. 12.*

putrefaction°, with their *ſalts* and *ſulphurs* ready for flight, and in that poſture catch'd by the adventitious cold, are probably ſo *congealed* at the top of the *water*. How conſonant to truth this *Theory* may be, I leave to the Readers judgment and future experience, and by the way would have him take notice, that as this, ſo my other opinions hereafter to be mentioned, are not magiſterially laid down, ſo as to juſtle out better whenever they can be brought, but fairly to have their tryal, and ſo live or dye. But as to the matter of Fact, as I cannot but think it hard that ſo many people ſhould agree in a falſity, ſo methinks 'tis as difficult they ſhould miſtake in their judgments, ſince I was told by one of the ſobereſt of that *calling*, that he once knew a Hatchet caſually fall over-board into the River near *Wallingford*, which was afterwards brought up, and found in one of theſe *Ice-meers*.

16. And ſo much for the *ſalts* that give life to the *waters*, multiply the *Fiſh*, and are the cauſe of *congelations*; for the watry Plants it ſeems have their *vegetation* from none of theſe, but a higher principle, which ſome will have to be a *volatile Niter*, brought along with the ſhowers in their paſſage through the *Air*. That *ſubaqueous* Plants have a proportionable growth to thoſe on the Land after a ſhower of rain, is alſo the general voice of the *Barge-men*; and herein I am the rather inclin'd to believe them, becauſe 'tis a matter ſo much their intereſt to obſerve; our *water-men* here in theſe ſhallow *Rivers*, praying not ſo much for rain to fill them when low, as that weeds may alſo grow to help keep the *waters* when they have them, which will otherwiſe too ſoon glide away, to their no ſmall detriment. Some have thought this vigorous ſhooting of the *aqueous* Plants, ſo preſently ſenſible after plentiful ſhowers, to proceed rather from the ſoyls brought with them from the hills, and impregnated with *ſalts* fit to promote *vegetation*; but the contrary is evident from the former *Paragraphs*, for with ſuch as theſe the Rivers are daily fated, and yet this briſk *vegetation* is wanting till it rains: whence I gueſs that *terreſtrial* and *ſubaqueous* Plants (that I ſay not ſuch as delight in *uliginous* places) have their ſprightful ſhooting from different principles; and if to the former I ſhould aſſign a more fix'd, and to the latter a *volatile ſalt*, perchance I might not be much

° *Willis de Ferment. cap.* 8.

out

out of the way: but it being not ſo much my buſineſs to find the reaſons of *phænomena*, as to give the Reader ſuch hints as may lead his greater *ſagacity* to do it; I forbear ſaying more, *& manum de tabula*, only advertiſing him, that what has been ſaid of the *Iſis* may be indifferently applyed to the reſt of the greater *Rivers*, of which neither have I any thing more to add, but an unuſual accident that happened to the *Cherwell*, *An.* $166\frac{2}{3}$, which without one drop of rain, or any other viſible cauſe here, but from great and ſudden ſhowers that fell in *Northampton-ſhire*, ſwelled to that vaſt height, that in two hours time, not only the Medows were o're-flown, *Magdalen College* cellar drowned, and their raiſed Water-walks cover'd; but the River *Iſis* driven back as far as *Ivy-Hincksey*, at leaſt a mile from the confluence of the two *Rivers*.

17. But amongſt the many ſmaller *Rivulets*, perchance it may not be unworthy notice. (1.) That the two conſiderable *Rivers* of *Stour* and *Ouſe*, though but ſmall here and running but little way in it, yet riſe in this *County*; the one at *Swalcliff*, which goes into the *Severn* Sea in the *weſt*; and the other at *Fritwell*, whence it runs into the Sea between *Lincoln-ſhire* and *Norfolk* in the *eaſt* of *England*. And (2.) that the Fountain-heads of the River *Rea* lye for the moſt part in a plain Country, having little more to feed them, than juſt a declivity to facilitate their paſſage; which ſeems to argue, that all running *waters* owe not their continuance to rain and dews, collected as they ſay, on the ſpungy tops of hills, and ſent forth again ſomwhere in the declivity. And ſo do's a a ſmall Spring at *Cleydon*, that riſes in the ſtreet on the *ſouth* ſide of the Town, which continues running all the year, but moſt plentifully like the *Scatebra* of *Pliny* [p], in the dryeſt weather: to which add a Well at *Ewelme*, alſo *ſouth* of the Church, whoſe Springs run loweſt in the Winter ſeaſon, and advance in the Summer remarkably higher; as I am credibly informed from *Lambourn* in *Berk-ſhire*, all the Springs in that Town moſt conſtantly do. But I decline all engagement in this great Controverſie concerning the *origin* of Springs, till my Travels have ſupplyed me with more, and more certain evidences, as well for the one as other part of the queſtion.

18. That *Land-ſprings*, and ſuch as run but once perhaps in many years, have their riſe and continuance from plentiful ſhow-

[p] *Nat. Hiſt. lib.* 2. *cap.* 103.

ers,

ers, I think we have little reaſon to doubt, ſince we have them not at all, or but very weak in any Summer, or the dryer Winters: ſuch are thoſe that fore-tell (and naturally enough) the ſcarcity and dearneſs of Corn and Victuals; whereof that of *Aſſenton*, near *Henly* upon *Thames*, is one of the moſt eminent that I know of in *England*; and no queſtion is the ſame mentioned by *Johannes Euſeb. Nierembergius* [9], in his Book (as he calls it) of the *Miracles of Nature*. *In Britanniæ territorio Chiltrenſi ſunt fontes multi, &c.* by which, I ſuppoſe, he muſt mean the *Chiltern* Country of *Oxfordſhire*, *There are*, ſays he, *many Springs, which in fertile years are always dry; but before any defect, as the Harbingers of an approaching dearth, theſe waters get looſe, and as it were breaking priſon, they quickly unite into a forcible ſtream.* And ſo they did lately, in *An.* 1674. with that violence, that ſeveral Mills might have been driven with the Current; and had not the Town of *Henly* made ſome diverſion for them, their *Fair Mile* muſt have been drowned for a conſiderable time. Of theſe there are many in the County of *Kent*, which I know not for what reaſon they call *Nailbourns* there, and preſcribe them (ſome will) a certain time for their running, as once in ſeven, ten, or fifteen years. But the certain natural principle of ſuch Springs, altogether depending upon an uncertain cauſe, no heed is to be given to ſuch kind of ſtories, they being equally as vain as the perſons that broach'd them.

19. Beſide theſe conſtant and intermitting *Rivulets*, that always diſcharge themſelves into Seas or Lakes, we have others here of a peculiar kind that empty themſelves into neither of them: but as they firſt roſe out of the Earth, ſo preſently after a ſhort ſtay on it, ingulf themſelves again, and are no more ſeen. Two of theſe there are at *Shot-over Foreſt*, both riſing as I take it on the *north* ſide of the hill; the one not far from *Heddington* Quarry-pits, is conſtantly fed with a double Spring, yet after it has run about two Bows ſhoot, is received by a *rocky ſubterraneous indraught*, and appears no more: for though ſome have thought it to come forth again at the Pool of a Mill not far from it, yet after diligent ſearch I could find no ſuch matter. Another there is not far from *Foreſt-hill*, and I think in the Grounds of Sir *Timothy Tyrrill*, which ſomtimes in Winter runs with that violence, and has worn its *In-let* to ſuch a capacity, that it can and has received an *Ox*.

[9] *De Miracul. Nat. lib. 2. c. 26.*

20. Other

20. Other *waters* again are of ſo ſlow a pace, that they ſeem rather to ſweat than run out of the Earth, part whereof being ſpent in *exhalation*, and the reſt in ſating the dry neighboring Earth, do neither reach the Sea, are received in Lakes, nor ſwallowed up like the former, but of themſelves are ſtopt upon the very ſurface. And yet I have obſerved, and believe rightly too, that theſe are the moſt durable *Land ſprings* we have, witneſs that famous one of this kind at *Nettlebed*, which I know not from what old *Witch* heretofore, by way of deriſion, they call *Mother Hibblemeer*; whereas if we conſider how ſerviceable ſhe has been, being never known to fail them in the dryeſt Summer, and that in a Country ſo uncapable of Wells, that there's no ſuch thing to be found in the Pariſh, ſhe rather merits the eſteem of the *Nymph* of the place.

21. In *Weſtphalia* they have a Spring they call their *Bolderborn*[r], from a noiſe that it makes at the *exit* of the water; whether ours may deſerve the name, I know not, but ſuch a one there is in the Pariſh of *Glympton*, in a wood about a mile *ſouth-weſt* from the Church, in a place where there are ſtones in the form of Cockles; upon which account hereafter I ſhall mention it again. The *Springs*, as I remember, are in number three, and the moſt *ſouthern* one of theſe 'tis that has the humming noiſe, much like that of an empty bottle held with the mouth againſt the wind, which perhaps may be a reſemblance ſo befitting our purpoſe, that it may help to explain the cauſe as well as the ſound: for provided the channel be large within, and the paſſage forth ſomwhat narrow like a bottle, the colliſion of the water againſt the lips of the *orifice*, may well make a noiſe in a large vault within, eſpecially if the waters be indued with a ſpirit, as peradventure anon may be proved like enough.

22. Which is all I have to ſay concerning the flux of *Rivulets*, but that one there is at *Sommerton* makes a ſmall *Caſcade*, or fall of water about ſeven foot high; which were it not in the highway, but in a Gentlemans Garden, ſome uſe might be made on't for divers good purpoſes, but as the caſe ſtands I think it can have none, except for experiments of *petrifications*, for which ſure it cannot but be very excellent, ſince the living blades of graſs of not above half a years growth, within that ſmall time

[r] *Varenii Geog. lib.* 1. *cap.* 17. *prop.* 15.

are

are all covered with ſtone, and hang down the bank like ſo many *Iſicles*; and the Earth it ſelf over which it glides, as 'twere foliated over with a cruſt of ſtone like the *Moſco petroſo* of *Ferrante Imperato*[s]. Which brings me to a cloſer conſideration of waters, as they are eminently endued with any peculiar qualities, of *Petrification*, *Saltneſs*, or *Medicinal* uſe; of which in their order as briefly as may be.

23. Of *Petrifying waters*, though I doubt not but their kinds are as various, as the effects they produce; and the effects again, as the ſubjects they work on; yet I am inclined to believe that they all agree thus far, that they proceed in the main from the ſame ſtock and linage, and are all more or leſs of the kindred of *Salts*, which ſublimed and rarified in the bowels of the Earth into an inviſible ſteam, are received by the *waters* as their moſt agreeable *vehicle*, and brought hither to us at the riſing of *Springs*, as inviſibly as the particles of ſilver or gold, when each is diſſolved in its proper *menſtruum*: where meeting perchance with an ambient *Air*, much colder and chilling than any under ground, in all likelyhood are *precipitated*, and thrown down on ſuch ſubjects, as they caſually find at the place of their *exit*, which they preſently cloath with a cruſt of ſtone; or elſe (where *precipitation* or *cohesion* will not ſuffice) they paſs with the *waters* through the *pores* of the ſubjects, and are left behind in them juſt as in a *filter*.

24. The reaſon of which difference may probably be, that ſome of theſe *petrifying* ſteams or *atoms*, may be groſs and more bulky than ſome others are, and cannot be held up in the watry *vehicle*, without ſuch a heat as they have under ground, but fall, and by reaſon of their bigneſs, do not *penetrate*, but *adhere* to their ſubjects; whereas others that are fine, more minute and ſubtile, are eaſily ſupported in a *volatile* condition, and paſs with the waters into the cloſeſt *textures*.

25. If any body doubt whether ſtones, and ſo *petrifications*, ariſe from *Salts*, let him but conſult the *Chymiſts*, and aſk, Whether they find not all *indurated* Bodies, ſuch as ſtones, bones, ſhells, and the like, moſt highly ſated with the *ſaline* principle? Some mixture of *Earth* and *Sulphur* 'tis true there is in them, which give the *opacity* that moſt ſtones have; from which, according as

[s] *Dell' Hiſt. Natural. lib.27. cap.* 8.

they

they are more or leſs free, they have *proportionable tranſparency*, and ſom hardneſs too; as the beſt of gems, the *Diamant*, evinces. And if he ſhall ask what *Salts* are the apteſt to perform this feat of *petrification*, though the difficulty of the queſtion might well excuſe me, yet I'le venture thus far to give him an anſwer, That I have frequently ſeen at *Whitſtable* in *Kent*, how their *Coperas* or *Vitriol* is made out of ſtones that 'tis more then probable were firſt made out of *that*: to the Spirit of which *Vitriol* if you add Oyl of *Tartar*, they preſently turn into a fix'd and ſomwhat hard ſubſtance, not much inferior or unlike to ſome *incruſtations*; which ſeems to conclude, that from theſe two, all ſuch like *concretions* are probably made; and that could we but admit that *Ocean* of *Tartar*, which *Plato*[t] placed in the center of the Earth, and thought the origin of all our *Springs*, the buſineſs of *petrifications* were ſufficiently clear. To which I alſo add in the behalf of *Vitriol*, what's matter of fact, and prevails with me much, That where-ever I find ſtrong *Vitriol* waters, the *petrifying* ones are ſeldom far off; which as far as I have obſerved, I believe may be reduced to theſe three kinds that preſently follow.

1. Such as purely of themſelves are *petrifyed*, the very body of *water* being turned into ſtone as it drops from the rocks, which we therefore commonly call *Lapides ſtillatitios*, and ſhall accordingly treat of them in the *Chapter of Stones*, theſe not ſtrictly coming under *petrifications*, where beſide the *water* and *ſaxeous odour*, there is always required a ſubject to work on of a diſtinct *ſpecies* from either of the two; as in
2. Such as *petrifie* by *incruſtation*, and are only ſuperficial, or
3. Such as *petrifie per minima*, or *totum per totum*; of both which I ſhall inſtantly treat, but of the laſt more at large in the following Chapter.

26. *Incruſtations*, are *petrifications* made by ſuch *waters* as let fall their ſtony particles, which becauſe either of their own bigneſs, or cloſeneſs of the *pores* and *texture* of the Body on which they fall, are fixt only to the *ſuperficial parts*, as it were, by *aggregation*, and do not enter the ſolid body; of which I have met with ſeveral in *Oxford-ſhire*, and particularly at *Sommerton*, as was above-mentioned, where the graſs, being one of the *fluvia-*

[t] *Anton. Galatæus de fluminum generibus.*

tilia, is covered over with a ſoft ſtone; and yet ſo, that broken off, the graſs appeared (for any thing I could ſee) as freſh and green as any other not *cruſted*, nothing of the blade being alter'd or impaired, which is the neareſt *incruſtation* I ever yet ſaw: for though ſome of theſe *petrified* blades of graſs hung down at leaſt a foot in length, yet ſlipping them off from about the root, I could take the graſs by the end, and pull it clean out as it were from a ſheath of ſtone, ſo little of *coheſion* had the one to the other: the reaſon of which I gueſs may be, that the *pores* of the Plant poſſeſt with its own juice, and already furniſh'd with a *congenial ſalt*, might well refuſe *adventitious* ones.

27. And yet far otherwiſe is it, but juſt on the other ſide the River at *North-Aſhton*, in a Field *north-weſt* of the Church, where either the *petrifying* water, or plants, are ſo different from what before I had found them at *Sommerton*, that though there too the work be begun by *adheſion*, yet the roots of *ruſhes*, *graſs*, *moſs*, *&c.* are in a while ſo altogether eaten away, that nothing remains after the *petrification* is compleated, but the figures of thoſe Plants with ſome augmentation.

28. And *petrifications* of this kind I frequently meet with, that happen on things of much different ſubſtances, as *ſhells*, *nuts*, *leaves of trees*, and many times on their moſt *ligneous* parts. In the Pariſh of S^t *Clements* in the Suburbs of *Oxford*, about a quarter of a mile diſtant, on the right hand of the firſt way that turns *eaſt-ward* out of *Marſton-lane*, there is a ditch, the water whereof *incruſtates* the ſticks that fall out of the hedge, and ſome other matters it meets with there: but this is ſo inconſiderable, that I ſhould not have mention'd it, but that it has been taken notice of by ſo many before, that my ſilence herein would have looked like a defect. Much better for this purpoſe is the water of a Pump at the *Croſs-Inn* near *Carfax*, in the City it ſelf, which not only *incruſtates* boards fallen into it, but inſerts it ſelf ſo intimately into the pores of the wood, that by degrees rotting it away, there is in the end the ſucceſſion of a perfect ſtone; and that not without ſome courſe repreſentation of the very lineaments of the wood it ſelf: Which though I muſt confeſs to be of ſomwhat a higher kind of *petrification* than *incruſtation*, yet it being wholly performed by acceſſion of parts, and continual intruſion into the open pores of rotten wood, will not amount to the warranty of a different *ſpecies*.

29. A

29. A curious pattern I have of this kind, in a piece of wood given me by Mr *Pomfret* School-master of *Woodstock* (whose care in my enquiries I must not forget) wherein nature has been so seasonably taken in her operation, that the method she uses is easily discovered; for being interrupted in the midst of her work, one may plainly see how the stony *atoms* have intruded themselves, as well at the *center* as *superficies*, and so equally too into all parts alike, that 'tis hard to discern in any part of it, whether stone or wood obtain the better share.

30. *Petrifications* of this kind are always *friable*, and though sometimes they faintly shew the grain, yet never, that I could see, keep the colour of the wood; in the fire they are as *incombustible* as any other stone, and lose nothing of their extension, but their colour for the most part seems to alter toward white: in distilled Vinegar they remain *indissoluble*, though not without the motion (as Mr *Hook*[u] well observes) that the same spirit has when it corrodes *Corals*, yielding many little bubbles, which in all probability (as he says) are nothing else but small parcels of Air driven out of its substance by that insinuating *Menstruum*, it still retaining the same extension: but in *aqua fortis*, the *Sommerton* crust was wholly dissolved into a white substance, not unlike the *white wash* used by *Plaisterers*. All of them increase the bulk of the subject on which they work; and most of them, as the ingenious Mr *Hooke* also further notes, seem to have been nothing more but rotten wood, before the *petrification* began.

31. But some others I have seen of a far nobler kind, that shew themselves likely to be *petrifications per minima*, and performed with a steam so fine, as *permeates* the very *schematism* and *texture* of the body, that even to a *Microscope* seems most solid, and must in all likelyhood be as *tenuious* as the subtilest *effluviums* that come from a *Magnet*; some whereof are so unlike rotten wood, that they keep the colour and *texture* of heart of Oak, and are some of them so hard that they cut Glass: and with one of them, that seems formerly to have been a piece of *Ground-ash*, I strook fire to light the candle whereby I write this. But I have nothing more to say of it here, because I guess the change not to have been wrought by *water*; that therefore I offer not violence to the Chapter of *Earths*, by which I think this, and all

[u] *Micrograph. Obs.* 17.

other of the kind, I have met with in *Oxford-ſhire* have been performed; I forbear, and proceed to the other *ſalt waters* that are more eminently ſuch, and do not *petrifie*.

32. And amongſt *them*, we muſt remember to reckon all ſuch as are unfit for *waſhing*, and will not take *Soap*; for though theſe to our taſt are not ſenſibly *ſalt*, yet to our touch (as the Learned *Willis* [w] notes) they are harſh and unpleaſant, which they have from their too great *impregnation* with *Salts*: But what is a much more certain evidence of it, we do not find any but inſtantly *lathers*, except ſuch as hold an *acid ſalt*, and diſcover themſelves ſuch upon *evaporation*. To which may be added this very eaſie Experiment, That if to ſimple water, and ſuch as before would *lather* well, you add ſome few drops of Spirit of *Vitriol*, or ſome ſuch like *acid*, it preſently refuſes to mix with *ſoap*: The reaſon of which ſeems indeed to be no other, but the congreſs of the *acid ſalt* of the *water*, with the *fix'd* and *alcalizate* one of the *ſoap*, which it ſo wholly ſubdues to its own inclinations, that it will not permit it any longer to hold the oily parts of the *ſoap*, or mix them with the *water*; but now viſibly increaſed both in quantity and weight, by the conſiderable *acqueſt* of this new priſoner, it may alſo perhaps ſo fill up the *pores* and little cells of the *water*, that the excluded *ſulphur* or oily parts of the *ſoap* (as in their ſeparate nature) are forced to the ſurface.

33. Many of theſe waters are every where found, and according to ſome, all *Pump* waters are ſuch; but that they are miſtaken, my experience has taught me, for I have met with ſome that will *lather* very well.

34. At *Henly* they are troubled with many of them, but not ſo much as they are at *Thame*; for there they have a way to let them ſtand two days, within which time (as I was informed by my worthy Friend M[r] *Munday*, Phyſitian there) the *Vitriol*, or whatever other *acid* it be, falls down to the bottom of the Veſſels that hold them, and then they will waſh as well as one can deſire. But at *Thame*, where there is never a Well in the whole Town whoſe water will waſh, or (which is worſe) brew: This Experiment, for I cauſed it to be tryed, will by no means ſucceed; ſo that were they not ſupplyed by the adjoyning Rivulet, the place muſt needs be in a deplorable condition. The reaſon, I

[w] *De Ferment. cap. 9.*

ſuppoſe,

ſuppoſe, why the *acid* will not fall, as it do's at *Henly* and ſome other places, is becauſe theſe waters, beſide their ſalt, in all probability alſo hold a crude *Sulphur*, whoſe viſcous particles do ſo tenaciouſly embrace it, that it will not admit of any ſeparation; which may alſo perhaps be a hint to the cauſe why their Beer will ſtink within fourteen days whenever they attempt to brew with this *water*, for where a *Sulphur* is any thing great in quantity, and its body opened and exalted by the heat in brewing, and the active ſpirituous particles of Mault, (as I gueſs the caſe may have it ſelf here) the frame of that *mixtion* may probably be looſed, wherein the *ſpirits* firſt taking their flight, the *Sulphur* will next begin to *evaporate*, whoſe ſteams being ſmartly *aculeated* by the *ſalt*, that then bears the chief ſway in the ſubject, cauſe the ſtink of the Beer that is brewed with ſuch water.

35. Other waters there are that are palatably *ſalt*, and ſufficiently ſtinking without being brewed, and ſuch is that beforementioned near *Churchill*-mill; but I think within the bounds of the Pariſh of *Kingham*; The water as it ſtands looks of a greeniſh colour, as moſt of the palatably *ſalt* waters do, and to it reſort all the Pigeons in the Country; which ſhould they not do, I ſhould much wonder, ſince beſides its ſaltneſs it has ſuch a ſtink, that it equals the *ſalt ſtone*, and *roaſted dog* too: ſo that ſhould the *Proprietor* but build a Dove-houſe here, he might honeſtly rob all his neighbors of their flights; but that he may not put it to ſo invidious a uſe, I ſhall divert him anon by a more profitable way.

36. As to the *ſalt* that impregnates this *water*, I do not take it to be a ſimple one, but ſome Mineral *concrete* both of *ſalt* and *ſulphur*; for without theſe two be in their exaltation, and become ſo far fluid as to endeavor a divorce from each other, it could never acquire ſo noiſom a ſmell. Which *concrete* ſhould I call a *ſalt Marine*, peradventure I might not be much miſtaken; for if you take but a ſmall quantity of thrice calcined *Bay ſalt*, and diſſolve it in a pint of Well-water, upon diſſolution you will have much ſuch an odour, as has been obſerved by a late Author in a ſhort account of the *Sulphur* Well at *Knarsborough*[x].

37. Nor hinders it at all that the *Sea* is ſo remote, ſince whether *ſprings* have any communication with it or no, ſuch *marine ſalts* may be had very well; for if the *Sea* grow *ſalt* by the Earth

[x] *Simpſons Hydroleg. Chym part.* 2.

that

that it licks, which I take to be as certain as that 'tis not ſo by *torrefaction*; then if it be poſſible we may have ſuch Earths, as give the *Sea* thoſe *ſalino-ſulphureous* tinctures, it's altogether as poſſible we may have ſuch *waters* too, without any neceſſity of ſuch communication.

38. If it be objected, That the *waters* of the *Sea* ſend forth no ſuch ſtench as we find theſe do, let it be conſidered that the flux of the one, and ſtagnation of the other, may well occaſion ſuch a difference; whil'ſt the *Sea-waters* are in their motion, 'tis true their *ſalts* and *ſulphurs* ſo involve one another, that their mutual imbraces hinder all *evaporations*; but whenever they come to ſtand but awhile, as they do moſt times in the holds of Ships, then their *ſulphurs* evaporate with as great a ſtink, as can be ſuppoſed ours have here at Land; and this the Ships pump doth frequently witneſs, to the great content of all that travel by *Sea*, it being a ſure indication of the Ships health, which abundantly recompences the inconvenience of the ſtench.

39. Such another I have heard of in the Pariſh of *Chadlington*, in the grounds of one M^r *Rawliſon* there, not differing in any thing at all from the former, but only it's ſomwhat ſtronger of the *marine ſalt*: this I muſt confeſs I ſaw not my ſelf, yet having my information from ſo knowing a Perſon, and of ſo unqueſtionable fidelity as Sir *Thomas Pennyſton*, I doubt not at all the truth of the thing.

48. A *ſalt ſpring* there is alſo at *Cliſton* near *Deddington*, within a Quoits caſt of the *River* ſide: but its *ſaline* particles are ſo ſubtilized in the *water*, that they ſcarcely can at all be perceived by the palate, and yet it lays them down plentifully enough on the ſtones and Earth over which it paſſes. What ſort of *ſalt* this is, I care not to determine, becauſe it will be difficult not to miſtake; for upon *evaporation* of about a gallon, it yielded a *ſalt* of a *urinous* taſt: which at firſt I muſt confeſs was ſo ſurprizing to me, that I could not but think, that during my abſence, ſome waggiſh fellow had either put a trick on me, or elſe that I might have uſed ſome unfit veſſel; whereupon I cauſed a new earthen pot to be bought, well glaſed, and then repeated the Experiment very carefully, but found in the end all had been honeſt about me; for I had a *ſalt* again of the very ſame taſt.

41. How this ſhould come about I cannot divine, unleſs from the

the ſweat of the Bodies of *Animals*, it being much uſed in *cuticular* Diſeaſes; but this I think neither can well be, becauſe 'tis a conſtantly running *ſpring*, and would ſure carry off what might be left of that nature: I therefore wholly leave it to the *Readers* greater perſpicacity, and ſhall content my ſelf with this ſatisfaction, that however improbable the thing may ſeem, that in the mean time 'tis an improbable truth.

42. I have often ſince wiſh'd, that I had tryed this *water* with a ſolution of *Alum*, and ſeen whether it would have given any thing of that milky precipitation it do's with *Urines*; which being then quite out of my head, is left to the tryal of ſome ingenious perſon that lives thereabout; though before-hand I muſt tell him, that I believe it will not ſucceed becauſe the *urinous* ſubſtance ſeems not to be copious enough.

43. Divers might be the uſes of theſe *waters*, and particularly of the two firſt, as good, or perhaps better than that at *Clifton*, for *cuticular* Diſeaſes of Men and Beaſts; ſome whereof I have known carryed out of theſe Inland *Countrys* to the *Sea* ſide; whereas 'tis likely they might (in all the Diſtempers for which we have recourſe thither) with much more eaſe have had a remedy at home.

44. But far more profitable muſt they ſurely be, if imployed to improve poor and barren Lands, which no queſtion might be done by caſting them on it. In *Cheſhire* [y], near the *Salt-pits* of *Nantwich*, 'tis yearly practiced thus to *brine* their Fields; which though never done, but after the fall of great ſtore of Rain-waters into their *pits*, which before they can work again muſt be gotten out, and with it ſome quantity of their *brine* too, yet even with theſe but brackiſh waters do they ſo ſeaſon their adjoyning Lands, that they receive a much more profitable return, then they could have done from any ſoil or dung.

45. In *Cornwall* and *Devonſhire*, ſo conſiderable are their improvements by *ſea-ſand*, that it is carryed to all parts as far as they have the advantage of the water, and afterwards 10 or 12 miles up higher into the Country on horſes backs: At which I muſt confeſs I marvel not at all, ſince we are informed by an intelligent *Gentleman* of thoſe parts [z], that where-ever this ſand is

y *Sir* Hugh Plat's *Jewel-houſe of Art and Nature, cap.* 104. z *Philoſoph. Tranſact. Num.* 113.

uſed,

uſed, the ſeed is much and the ſtraw little, (*I have ſeen*, ſaies he in ſuch a Place, *good Barly, where the ear has been equal in length with the ſtalk it grew on*) and after the Corn is off, that the graſs in ſuch places turns to *Clover*. Some of the beſt of this ſand, he ſaies, lies under *Ouſe* or Mud about a foot deep; and who knows but there may be ſuch a Sand under the briny Bog near *Church-hill*-mill, or at *Chadlington*? I am ſure the *ſalt ſpring* at *Clifton* comes from a ſand; if ſo, and the Farmers thereabout get ſuch Corn and *Clover-graſs*, I hope I ſhall not want the thanks of the Country.

46. However, I do not doubt but the water will be ſerviceable, either to caſt on their Land, as at *Nantwich*, or to ſteep their Corn in before they ſow it, to preſerve it from all the inconveniencies formerly prevented by brining and liming it, and to ſtrengthen it in its growth.

47. Sir *Hugh Plat*[a] tells us, of a poor *Country-man* who paſſing over an arm of the *ſea* with his Seed-corn in a ſack, by miſchance at his landing fell into the water, and ſo his Corn being left there till the next *Ebb*, became ſomwhat brackiſh; yet ſuch was the neceſſity of the Man, that (notwithſtanding he was out of all hope of any good ſucceſs, yet not being able to buy any other) he ſowed the ſame upon his plowed grounds; and in fine, when the Harveſt time came about, he reaped a crop of goodly Wheat, ſuch as in that year not any of his Neighbors had the like.

48. Now let the Owners or Farmers of theſe *ſprings* ſit down and conſider of what has been ſaid, and if they ſhall think fit, make tryal of them, wherein, if they meet with ſucceſs, I only beg of them (which I ſhall gladly accept as the *guerdon* of my labors) that they would be as free of it to their poor Neighbors that have lean grounds and ill penny-worths, as *God* has been to them by me his weak inſtrument in the diſcovery.

49. Having ſpoke of ſuch *waters* as cure faulty grounds, and cuticular diſtempers by external application, it followeth, that we treat of ſuch as are, or may be taken inwardly, and deſerve the repute of *Medicinal waters*. The firſt, and perchance the beſt of theſe, I found at *Deddington*, a ſmall *Mercat Town*, within the Cloſe of one Mr. *Lane*, where not long ſince digging a Well,

[a] *Id. loco citato.*

and

and paſſing through a blew Clay, adorned with ſome glittering ſparks; and meeting by the way with *pyrites argenteus*, and a bed of *Belemnites*, or (as they call them) Thunder-bolts, He came within few yards to this water, of a ſtrong *ſulphureous* ſmell, the moſt like of any thing I can think of, to the water that has been uſed in the ſcouring a foul gun: in weight lighter than pure Spring-water by an ℥*ſs*. in a quart, and yet after ſeveral tryals, I found it ſo highly impregnated with a *vitrioline ſalt* as well as *ſulphur*, that two grains of the powder of *galls* would turn a gallon of *water* into a dusky red, inclining to purple; nor did they only ſo alter the *ſite* and poſition of the particles, as to give a different colour and conſiſtence, as it happens in *waters* but meanly ſated; but in a quarter of an hour did ſo condenſe and conſtipate the pores of the watery *vehicle*, that the excluded particles of the *Minerals* appeared in a ſeparate ſtate, curdled in the Veſſel, and of ſo weighty a ſubſtance, that they ſubſided to the bottom in a dark blue colour.

50. The ſediment being great in quantity, I tryed upon *red hot Irons*, and ſome other ways, to ſee whether the *ſalts* or *ſulphur*, either by colour, ſcintillation, or odour, might not by that means betray themſelves; but with ſmall ſucceſs: whereupon I betook me to *diſtillation*, putting about a quart into a glaſs *body*, to which fitting a head and clean receiver, I gave an eaſie heat, till there was diſtilled off about three or four ounces, which when poured out, I found had neither ſmell, taſt, or any other properties, that might diſtinguiſh it from any other *ſpring water* diſtilled: for with galls it would make no more alteration than any other *ſimple common water* would. Then ordering the fire to be ſlackned, to ſee what *precipitate* it would let fall; upon *filtration* of what remained in the *body*, I procured only a pale *calx* of a gritty ſubſtance, ſhewing, as it dryed in the *Sun*, many tranſparent particles intermix'd: in taſt it had a faint pleaſant piercing, with a gentle warmth diffuſed on the tongue; but pouring on it *Spirit of Vitriol*, *Oyl of Tartar*, *&c.* I could not perceive any manifeſt ebullition, ſo as to judge whether the *ſalt* contained in this reſidence, were either of the *acid* or *lixiviate* kind.

51. Wherefore to come cloſer to the point, and taking directions from that *accurate, ſevere, and profound Philoſopher*, the Honorable *Robert Boyle* Eſq; the glory of his Nation, and pride

of his Family; and to whoſe moſt ſignal Encouragement of the Deſign in hand, theſe Papers, in great part, owe their birth: I took good *Syrup of Violets*, impregnated with the tincture of the Flowers, and drop'd ſome of it into a glaſs of this *water* as it came from the Well; whereupon, quite contrary to my expectation, not only the *Syrup*, but the whole body of the *water* turned not of a red, but a brisk green colour, the Index of a *lixiviate*, and not that *acid Vitriol*, which I before had concluded on from the infuſion of *galls*. The *Phænomenon* at firſt was very ſurpriſing, till I had further weighed the cautious Expreſſions of that *Noble Author* [b], and found, that he reſtrains the Experiment of the *Syrup of Violets*, turning red with *acids*, with proviſion always they be diſtilled Liquors; and what he ſeems to hint in a former Experiment *, that *ſulphureous ſalts*, (ſuch as the *Vitriol* of this water will anon more plainly appear to be) being of a quite contrary nature, may have different effects: which may alſo be the reaſon why this *ſulphureous water*, notwithſtanding it moſt certainly poſſeſſes an *acid ſalt*, will yet as certainly lather with *ſoap*, and raiſe a greater *ſud* than other waters commonly do; and if put into *milk*, though boiled up to the height, will not ſeparate the more groſs from the *ſerous* parts of it: *effects* ſo uſually following upon ſuch applications, that perhaps till now they have always been ſuppoſed, never as yet to have happened otherwiſe.

52. But *Experience*, that great baffler of *ſpeculation*, aſſures us the contrary to be poſſible enough, and brings matter of fact to confute our ſuppoſitions in the very tryal of this *water*, wherein the great quantity of *Vitriol*, is yet ſo cloſe lock'd up by the viſcous particles of *Sulphur*, and thereby rendered ſo dull and unactive, that it cannot exert its enmity to (as D^r *Mayow* [c]) or friendly embraces with (as D^r *Willis* [d]) the *alcalizate ſalt* it finds in the *ſoap*; or ſo compreſs the pores of the *milk*, as thereby to cauſe a *precipitation*: but having as it were thus put on the nature of a *fix'd ſalt*, acts not upon its like, nor longer enjoys the aſtringent power of an *acid*.

53. And under this vizor of a *fix'd Alcali* it was, that it acted its part, and with *Syrup of Violets*, gave a green tincture; unleſs

[b] *Hiſt. of Colours, Exper.* 20. * *Ibid. Exper.* 10. [c] *De Thermis Bathonienſibus, ſub finem.* [d] *De Fermento. cap.* 11.

we

we may allow its ſalt to be a *volatile Alcali*, with which alſo that *Syrup* turns to the ſame colour: to admit ſuch a thought 'tis true is very hard, yet finding but a mile off, at *Clifton* as above-mentioned, a *Spring* ſtrangely ſated with ſuch a kind of *ſalt*; I adventur'd to try another Experiment of the aforeſaid *Honorable Author*, and according as he directs [c], made a ſolution of *ſublimate* in fair water (the only *Criterion* I yet know of, that plainly diſtinguiſhes the two *Alcali's*) to which I added this Well-water, in great, ſmall, and the intermediate quantities: but it anſwer'd not at all the deſign of the *Experiment*, not giving the tawny, much leſs the white *precipitate*: Whence 'tis eaſie to conclude, that this alſo ſucceeds only in diſcriminating *Chymical ſalts*, as that great *Virtuoſo* well obſerves, and not in the immediate products of Nature.

54. One thing more I could not but obſerve, that notwithſtanding the powers of the *Vitriol* are thus reſtrained in reference to its acting on *ſoap* and *milk*, that yet it has its uſual effect upon *Iron*: for the corroſion of the Pump-rod I muſt believe to proceed from *Vitriol*, till any one upon better grounds can convince me, that 'tis likely it may be from ſomwhat elſe; and yet this neither do I conceive to be done, but by ſuch ſteams as aſcend in the Well, and are freed from the ſhackles of *Sulphur*, much queſtioning whether the Pump-rod under, or near the bottom of the water, be eaten ſo or no.

55. To this add, that although the *Sulphur* do's exerciſe ſuch dominion over, and ſo cloſely knits up the *Vitriol*, whil'ſt together in the *water*, yet it may and do's too, let go its hold; and like, what is reported by *Henricus ab Heers* of his *Spadacrene*, and the *Sauvenir* by *Frambeſarius*, can hardly be kept within any bounds, but expires through glaſſes ſtopt never ſo cloſe; 'tis true, I had not the conveniency there of putting it under the *Hermetick ſeal*, but ſo eaſie a paſſage it made through a good cork cover'd over with wax, and both bound down with a double leather, that in ſix miles riding it loſt all its virtues, not giving then any tincture with *galls*, and having but a faint putrid ſmell of the *Sulphur*: Whether it loſt in weight or bulk, as well as *volatile Spirits*, I muſt acknowledge I was not then enough curious to obſerve; but imagine it might, ſince 'tis plain from its not

[c] *Hiſt. of Colours. Exper.* 40.

tinging with *galls*, that not only the *Sulphur*, but alſo the *Vitrioline* particles exhale with it, and corporeally ſeiz on the next agreeable ſubject, which 'tis manifeſt they did on the above-mentioned Pump-rod.

56. Beſide the more conſiderable ingredients of *Vitriol* and *Sulphur*, 'tis evident that this *water* alſo holds ſome ſmall quantity of *Naphtha*, one of the liquid *Bitumens*, which flies not away like the two former, but after ſeparation of the parts, made either by *precipitation* with *galls*, or inſenſible *evaporation*, remains ſwiming on the top in a thin skin, variegated as it were with the colours of the Rain-bow, much after the ſame maner as 'tis frequently ſeen upon waters ſtanding in boggy grounds, or ſuch places where we dig the *bituminous Earths* called *Peats*: But whether this will burn at all, or with any ſuch bright flame exceeding that of *ſulphur*, as [f] *Hen. ab Heers* affirms of ſuch a film that covers the waters of his *Spadacrene*, if kept all night, I have left to ſome ingenious perſon thereabout, that has both more ſkill and leiſure to try.

57. At *Banbury*, another *Mercat Town* about four miles hence, at D[r] *Lanes* Phyſitian there, Brother to the above-named M[r] *Lane* of *Deddington*, and my very good Friend; there is alſo another *ſulphur* Well, much like the former in taſte, but not altogether of ſo ſtrong a ſmell, holding, I ſuppoſe, either much more *ſalt* than that, or a leſs tenacious *ſulphur*: for here I found not the energy of the *Vitriol* ſo fetter'd by the vigorous particles of *ſulphur*, but that it had power to make that hoſtile or friendly congreſs with the *lixiviat ſalt* of *ſoap*, and ſend the oily part to float at top, making no lather or mixtion with it; and alſo ſo to conſtipate the pores of boiled *milk*, as to ſeparate its parts into curds and whey. The quantity of *ſalt* appeared upon evaporation made by the ſaid D[r] *Lane* ſince I was there, but how much to a quart or gallon he ſent me no word. This *water* has alſo a *volatile* part, collected by the ſaid Doctor, which I did not find that *Deddington water* had; upon the tongue it ſeems to have a little pricking, but nothing that I could perceive of a ſaltiſh taſt, wherefore trying further with a convenient *Menſtruum*, it at laſt confeſt it ſelf to be *Flores ſulphuris*, *precipitating* with the ſame ebullition, ſmell, and colour, that ſome others did I had from the ſhops.

[f] *Hen. ab Heers Spadacrene, cap.* 4.

58. An-

58. Another of these of a *sulphureous* smell that will not take *soap*, and turns *milk*, I found at *Bould* in the Parish of *Idbury*, in part of the possessions of one Mr *Loggan*, a worthy Gentleman, (whose assistance in the tryal of this *water*, and furtherance in my other business, I cannot without ingratitude ever forget:) which differs from the former only in this, that besides its tinging red with powder of *Galls*, with spirit of *Urin* it turns white, which (as I had observed before at *Banbury*) that would not do: whence I have ground to suspect, that over and beside the ingredients of that, here must in all likelyhood be somthing of *Alum*; and in this opinion I am the more confirmed, since I am informed, by the Controversie between Dr *Wittie* and Mr *Sympson*, that *Vitriol* and *Alum* are somtimes found together, as in the Cliff near the *Scarborow Spaw*. And that in *Sweden* [g] there is a single stone of a yellow colour, intermixed with streaks of white, and very weighty, that affords *Sulphur*, *Vitriol*, *Alum*, and *Minium*; now that such a stone is here, though I dare not assert, yet questionless there may be somthing not so altogether unlike, but whenever there is occasion of digging there-about again, the stones and earth may deserve examination *.

59. I should next have proceeded to the *waters* impregnated with *Vitriol* only, but that I am called back to *Deddington* again by another *water* of a fetid odour, in stench much exceeding all before-mentioned. This I met with in a small Close behind a Barn, within a furlong or less of that at Mr. *Lanes*, having the House where the *Dutchy-Court* is kept to the East, and the *Guild* West, and belonging to *Ch. Ch. Coll.* in *Oxon*, in smell so perfectly resembling that of *rotten eggs*, and accordingly so strongly affecting the sense, that I could not so much as put it to my mouth without danger at least of straining to vomit. Such a one as this is mentioned by *Georgius Agricola* [h], at the Castle of *Steurewald* in the *Bishoprick of Hildesheim*, within a mile of *Hasda*; where, says he, there is another Spring that sends forth a stink, *qualis est pulveris bombardæ exstincti*: a description so agreeable also to our *sulphur well* at *Deddington*, that as I could not at first but wonder, that two such *waters* should be found at places so far asunder, so strangly alike; so it gave me a hint, that these

g *Philosoph. Transact. Num.* 21. *Vid.* Olai Wormii, *Musæum de eodem, cap.* 9. * *At* Snowdown-hill, *in* Carnarvan-shire, *there are also such stones. Dr.* Merrets *Pinax rerum Nat. p.* 217. h *Lib. De Natura eorum quæ effluunt ex terra.*

waters

waters in all probability might receive their tinctures from the ſame *Minerals*, and that their difference might only lye in the diſtances they have from the *Mineral* bed, or more *Colanders* the one may paſs through than the other. *Agricola* obſerves, that the water at *Steurewald* ſmelling like ours, much like *rotten eggs*, not only comes forth of a *Marble* Quarry, but that the belchings of ſuch as drink it faſting, give alſo the odour of brayed *Marble*. Whether ours have either ſuch a paſſage or effect, I muſt confeſs I cannot inform the Reader; my Purſe not affording me to try the one, nor my Stomach the other: However, I could wiſh it had not been ſtop'd up, as I hear it is ſince my being there, not only for the uſe it might have, but that Perſons better qualified than I, might have made the *Experiments*.

60. Of *Vitriolate* and *Ferrugineous ſprings*, there are alſo plenty in this *County*, one at *Nether-Worton*, and another at *North-Weſton* *, within leſs than a Bolts-ſhot of each of their Churches; both of theſe, beſide their tinging with *galls*, let fall a ſediment of a *ruſty* colour; only with this difference, that *Nether-Worton* ſpring is much the quicker and clearer, though I doubt not the other might be very well amended, were but little charge beſtowed on it.

61. At *Shipton* under *Which-wood* there is another of theſe, at an Inn there whoſe ſign is the *Red-horſe*, but ſo weakly impregnated with the *Mineral*, that it ſcarce tinges ſenſibly with the powder of *galls*, yet lays down the *ruſty* ſediment in as great quantities as any of the reſt; and I have met with ſome at other places that have plentifully enough yielded *this*, which by no means could ever be brought to confeſs any thing of *Vitriol*, which has begotten a ſtrong ſuſpition in me, that this *ruſty tincture* may probably be the *effluvium* of ſome other Body, different from, and not of the *chalybeat* kind: for were it ſo, I cannot imagin but the *ſalt* of *Mars* muſt needs be diſcovered. However, herein I will not be poſitive, but propound it only as the ſubject of a ſeverer reſearch.

62. And of theſe I was told of a very odd one in the Pariſh of *Heddington*, near a place called the *Wyke* (I think) now ſtop'd up, that in the *winter* time would ſtrike with *galls*, but not in the *ſummer*: whereof may be given this very eaſie reaſon; that

* *I found another ſince, near* Whites-Oak *in the Pariſh of* North-Leigh.

during

during the time of *winter*, the pores of the Earth being ſtopt, and the *Mineral* thereby not permitted to exhale, the *water* is then impregnated with it, and gives the *tincture*; whereas in the *ſummer* ſeaſon it expires ſo much, that the depauperated *water* can ſhew nothing of it. That *waters* do thus alter according to the Seaſons of the Year, I found alſo to be manifeſt from the *waters* of *Deddington*, which I found ſomtimes lighter, and at other times heavyer than common *water*, and to give much different *ſediments* at divers tryals with the ſame materials. And this I thought convenient to note, not only to excite Men to more critical Obſervations, but that the curious *Explorator* may not be ſtartled, in caſe he find them at any time not exactly to anſwer.

63. In the *Park* at *Cornbury*, not far from the *Lodge*, in a pit newly digged, there riſes a *ſpring* alſo of a *Vitriol* kind, colouring the mud and earth under it very black; into this pit, it being deſigned for a *conſervatory of Fiſh*, they put over night ſome of ſeveral ſorts, but found them next day in the morning all dead; which gave me good ground to ſuſpect (having juſt before met with a relation of Dr. *Witties*[1], *That Carps put into a Copper Brewing-veſſel to be preſerved but for one night, were all found dead in like maner in the morning*) that here might be ſomthing of that nature too; and that the *Vitriol* wherewith this *water* is fated, might rather be that of *Venus* than *Mars*: And in theſe thoughts I was the more confirmed, when I quickly after was informed, of an odd kind of ſteam that roſe hereabout of a ſuitable effect. But of this no more, leaving its further conſideration to the Right Honorable and ingenious *Proprietor* of the place, and my ſingular good Lord, *Henry Earl of Clarendon*, a moſt effectual encourager of this deſign.

64. To theſe I muſt add another ſort of *waters*, which though in taſt they reſemble *milk*, muſt yet I believe be reduced to this Head, for I find, notwithſtanding their eminent ſweetneſs, they all refuſe to lather with *ſoap*, and therefore conclude them to hold ſome *Acid*: Of theſe we have ſeveral within the City of *Oxford*, one at a Pump over-againſt the *Croſs Inn*, another near the Mount in *New College* Garden, and a third at the Pump at *Buckley Hall*, now the dwelling houſe of one Mr. *Bowman* a Book-ſeller, and ſeveral other places *: All which, notwithſtanding their *lacteous*

[1] *Anſwer to* Hydrologia Chym. *p.* 25. * *I heard of ſuch another ſomwhere near* Wardington.

taſt,

taſt, I gueſs may be impregnated with ſomthing of *Vitriol*, which though of it ſelf it be a ſmart *acid*, yet its edge being rebated with a well concocted *ſulphur*, turns ſweet, and becomes of that more palatable guſt. And herein perhaps I have not gueſs'd amiſs, ſince we are informed by as eminent, as 'tis a vulgar Experiment, that the auſterity that *Vitriol* gives in the mouth, is corrected by the fumes of *Tabacco* taken quickly after it; *whoſe ſulphureous particles*, ſays the Learned *Willis*[k], *mixing with the ſaline pontic ones of the* Vitriol, *create ſuch a pleaſant and melliſluous taſt.*

65. There are alſo two ſmall and very weak *ſprings*, of a *lacteous* colour but no ſuch taſt, in the way from *South-ſtoke* leading to *Goreing*, by the River ſide; not many years ſince of great repute in thoſe parts for *Medicinal* uſe, but now quite deſerted; whether upon account of the ineffectual uſe of them, or becauſe they are but temporary ſprings, *ſub Judice lis eſt:* The people will tell you they were very ſoveraign, and never ceaſed running till ſome advantage was made of the *water*, and that *Providence* till then with-held them not. This *water* iſſues forth from a fat whitiſh Earth, and has always a kind of unctuous ſkin upon it, yet to the taſt I thought it ſeemed dry and *ſtiptical*, as if it proceeded from a kind of *Lime-ſtone*, further within the Earth, and not to be ſeen.

66. But however the caſe may have it ſelf there, it is not ſo dubious, that at a Well in *Oddington*, there is a water of the *calcarious* kind, and proceeding ſure from ſome neighboring *Lime-ſtone*, which beſide its dry and *reſtrictive* taſt, more ſignally evidences it ſelf, in the *providential* cure of a local Diſeaſe amongſt Cattle, frequently catch'd by their graſing on *Otmoor*, and therefore by the Inhabitants thereabout commonly called by the name of the *Moor-Evil*: The Diſeaſe is a kind of flux of the belly, and correſponds (in a Man) to what we call a *Dyſentery*, whereby the Cattle ſo ſpend themſelves, that in little time from well and good liking, they fall in a maner to ſkin and bone, and ſo dye away unleſs prevented; which is certainly done by giving them dry meat, and ſuffering them to drink of *this water* only.

67. Beſide theſe we have many other *waters*, not apparently (at leaſt to ſenſe) of any *Mineral* virtue, yet without doubt have their *tincture* from ſome *ſubterraneous* ſteam, of a much finer than

[k] *De Anima Brutorum, cap.* 12. *De Guſtatu.*

ordi-

ordinary, and therefore unknown *texture*. Such are thoſe in many places accounted ſo ſoveraign for the *Eyes*, and cure of inveterate *Ulcers*, after the ineffectual tryals of the beſt *Chirurgions*: Theſe for the moſt part, and perhaps not undeſervedly, are commonly ſtiled *Holy-wells*, not only for the good they have formerly done, but for that they ſeem to be the immediate gift of *God*, and deſigned for the *poor*.

68. A very eminent one of theſe there is in the Pariſh of *Sandford*, not far from *Great Tew*, which within the memory of many thereabout, hath done great cures upon putrid and fetid old ſores, a long time before given over for incurable. Theſe *waters* have with them, according to the obſervations of the ingenious Doctor *Beal*[l], a kind of active friction, but intermingling with their aſperities ſuch a pleaſant titillation, as invites the Patient to rub on the terſive *water*, and will all along recompence the pain of ſearching the wound, with ſuch ſpeedy and indulgent degrees of ſanation, as mitigates the torment with variety of pleaſures.

69. And thus (as I am informed by perſons of unqueſtionable fidelity, that have often uſed them for their *eyes*, and in ſome other caſes) do the *waters* of *St. Croſſes* in the Suburbs of *Oxford*, whoſe Well was heretofore, and in ſome meaſure yet remains, ſo conſiderable for ſuch like purpoſes, that the great reſort of people to it has given occaſion of change to the name of the Pariſh, which to this very day we call now nothing but *Holy-well*.

70. But of much greater Fame was the Well of St. *Edward*, without St. *Clements* at *Oxford*, now quite ſtop'd up; but as 'tis remembred by ſome of the antienteſt of the Pariſh, was in the field about a furlong S. S. Weſt of the Church; this at leaſt was believed to be ſo effectual in curing divers diſtempers, and thereupon held to be of ſo great *ſanctity*, that here they made *vows*, and brought their *alms* and *offerings*; a cuſtom, though common enough in thoſe days, yet always forbidden by our *Anglican Councils*[m], under the name of Wilpeorþunga [*Wilveorthunga*] more rightly tranſlated *Well-worſhip* than *Will-worſhip*, as is plainly made appear by the *Reverend and Learned Dr. Hammond*[n], out of an old *Saxon Penitential*, and a *Saxon Homily of Biſhop Lupus*; where the word ꝓil is rather ſhewed to ſignifie *fontem*, than *voluntatem*. Againſt theſe *ſuperſtitions* ſo ordinary in thoſe days, there are ſe-

[l] *Philoſ. Tranſact. Num.* 57. [m] *Canonibus ſub* Edgaro. *Can.* 60. [n] *Annotat. on Epiſt. Coloſſ. c.* 2. *v.* 23.

veral *prohibitions* in the fore-cited *Penitential* and *Homily*. And of which kind are alſo divers *Injunctions* to be ſeen in the Office of *Lincoln*, of *Oliver Sutton*; and amongſt them, one particularly againſt the worſhip of this *Well* of St. *Edward*, without St. *Clements* in *Oxford*, and St. *Laurence*'s *Well* at *Peterburgh*, *&c.*

71. And ſo much for the *Waters*, with the *Minerals* they hold; and perhaps too much too in ſuch like matters, may ſome Man ſay, for an unſkilful *Lawyer*: However, ſince what has been ſaid, has not been *magiſterially* impoſed, but modeſtly only, and timerouſly conjectur'd; and ſince I have not invaded another Mans *profeſſion*, by ſo much as naming the Diſeaſes they may probably cure, except where they have a known reputation already, I hope I may evade the imputations of raſhneſs, or putting my ſickle into another Mans Harveſt.

CHAP.

CHAP. III.

of the Earths.

OXFORD-SHIRE, says Mr. *Cambden*[o], is a *fertile County and plentiful, the Plains garnished with Corn-fields and Meddows, and the Hills beset with Woods; stored in every place not only with Corn and Fruits, but also with all kind of Game for hound and hawk, and well water'd with Rivers plentiful of Fish.* Which general description of the *Soil*, though in the main it be true to this day, yet if we come to a more particular and close consideration of it, we shall find, that though *Oxfordshire* almost in every part, where the industry of the Husbandman hath any thing shewed it self, doth produce Corn of all sorts plentifully enough; yet it has much more cause to *brag* of its *Meddows*, and abundance of *Pastures*, wherein (as in Rivers) few Countrys may be compared, perhaps none preferr'd. And as to matter of *Fruits*, I think I may better assert of it what *Giraldus* do's of *Ireland*, *Pascuis tamen quam frugibus, gramine, quam grano, fœcundior Comitatus*, than groundlesly to commend it overmuch.

2. The Hills, 'tis true, before the late *unhappy Wars*, were well enough (as he says) beset with *Woods*, where now 'tis so scarcy, that 'tis a common thing to sell it by weight, and not only at *Oxford*, but at many other places in the Northern parts of the *shire*; where if brought to *Mercat*, it is ordinarily sold for about *one shilling the hundred*, but if remote from a great Town, it may be had for *seven pence*: And thus it is every where but in the *Chiltern Country*, which remains to this day a *woody* Tract, and is (as I have very good ground to think) some of the *western* part of the great *Forest* Andredesfald, or Andredesleage, reaching, says *Leland*[p], from beside *Portus Limenus* in *Kent*, a 120 miles *westward*, which happily falls out to be about this place: To which had *Cæsar* ever arrived, he had never sure left us such an account, as we find in his *Commentaries* concerning our *Woods*: *Materia*, says he, *cujusque generis, ut in Gallia, præter Abietem & fagum*[q], i. e.

[o] *Britan. in Oxfordshire.* [p] *Lelandi Comment. in Cyg. Cant. in verbo Limenus.* [q] *De Bello Gallico, lib. 5. sub initium.*

that there was here all maner of wood, as in France, *except the* Fir *and* Beech: of the laſt whereof there is ſuch plenty in the *Chiltern*, that they have now there-about ſcarce any thing elſe; but it lies ſo far from *Oxford*, and ſo near the River ſide, which eaſily conveys it to *London* Mercat, that 'tis ſcarce beneficial to the reſt of the *County*.

3. As to the qualifications of the *Soil* in reſpect of *Corn*, I find them in goodneſs to differ much, and not only according to their ſeveral compoſitions (being in ſome places *black*, or *reddiſh earth*: in others a *clay* or *chalky* ground, ſome mixt of *earth* and *ſand*, *clay* and *ſand*, *gravel* and *clay*, *&c.*) but chiefly according to the depth of the *mould* or uppermoſt *coat* of the earth, and the nature of the ground next immediatly under it: for let the uppermoſt *mould* be never ſo rich, if it have not ſome depth, or ſuch a ground juſt underneath it, as will permit *all ſuperfluous moiſture to deſcend, and admit alſo the hot and comfortable ſteams to aſcend*, it will not be ſo *fertile* as a much leaner *ſoil* that enjoys theſe conditions.

4. Thus have I often-times ſeen in this *County*, in all appearance a very good *ſoil*, and ſuch indeed as would otherwiſe have been really ſo, leſs *fertile* becauſe of its ſhallowneſs, and a cold *ſtiff clay*, or cloſe *free-ſtone* next under-neath it, than a much poorer Land of ſome conſiderable depth, and lying over a *ſand* or *gravel*, through which all *ſuperfluous moiſture* might deſcend, and not ſtand, as upon *clay* or *ſtone*, to chill the roots and make the Corn languiſh.

5. Where by the way let it be noted, that I ſaid a *cold ſtiff clay* or *cloſe free-ſtone*; for if there be under a ſhallow *mould*, a *clay* that's mixed (as 'tis common in the blew ones of this *County*) either with *pyrites aureus*, or *braſs lumps*; or the ſtones be of the warm *calcarious* kind, it may nevertheleſs be *fruitful* in *Corn*, becauſe theſe, I ſuppoſe, do *warm* the ground, and give ſo much ſtrength, that they largely recompence what was wanting in depth.

6. More poſſibly might have been added to this general account of *Earths*, and not a little inſtructive to the *Farmers* of the *Country*, but I found moſt of them froward and to ſlight my *Quære's*; let them therefore thank themſelves if I am not ſo obliging: Beſide, it ſeems a buſineſs a little beſide my *deſign*, there-

fore

fore in haſt I proceed to a more particular Conſideration of *Earths* (as before of *Waters*) holding ſome *Spirit*, *Bitumen*, or *concrete Juice*, and as they are uſeful in *Trades*, or are otherwiſe neceſſary, convenient, or ornamental.

7. But herein I ſhall not ſhew my ſelf either ſo angry or ignorant, or ſo much either diſreſpect my ſubject, or the civilities of the *Gentry* for the ſake of the *clowns*, as not in the next place to treat of ſuch *Earths* whoſe moſt eminent uſes relate to *Husbandry*, ſince they alſo hold ſome *concrete Juices* (whereby they become improvements of ſuch poor barren Lands) and are therefore very ſuitable to my preſent purpoſe.

8. The beſt of theſe we call commonly *Marls*, whereof, though 'twas believed there were none in *Oxford-ſhire*, yet I met with no leſs than three ſeveral ſorts, and in quantities ſufficient enough for uſe. The *Britiſh Marls* were very famous of old, whereof *Pliny*[r] numbers ſeveral ſorts; and of principal note were the *Leucargillæ*, whereby, he ſays, *Britan* was greatly enriched: And of this kind, *that* I gueſs may be one, lately diſcovered by the much *Honored*, and my truly noble Friend, *Thomas Stonor* Eſq; of *Watlington-Park*, of which he already has had good experience: of colour it is *whitiſh*, a little inclining to *yellow*, not very fat, and of ſo eaſie diſſolution, that it may be laid on the ground at any time of the year, and may be as good, I ſuppoſe, for *paſture* as *arable*: this *he* found at a place near *Blunds-Court*, but I think within the Pariſh of *Shiplake*, where upon another account ſinking a deep pit, amongſt other matters he met with this *Marl*.

9. Since that, there has lately been another diſcovered by that eminent *Virtuoſo* Sir *Thomas Pennyſton*, in his own Grounds in the Pariſh of *Cornwell*, about a quarter of a mile *north-weſt* of his Houſe, of a blue colour, and ſo abſterſive, that it would readily enough take ſpots out of cloaths, and gave its *owner* ſome ground to hope, that poſſibly it might be fit for the *Fullers* uſe; but he quickly, upon tryal, diſcovered an incurable fault that the Men of that Trade will never pardon: however, I take it to be ſo rich a *Marl*, that it may amply recompence the induſtry of its *Maſter*, if laid on its neighboring barren Hills; which I *adviſe* may be done about the beginning of Winter, that the Froſts and

[r] *Plin. Nat. Hiſt. lib.* 17. *cap.* 6, 7.

Rain

Rain may the better ſeparate its parts, and fit it to incorporate with that hungry Soil.

10. Which condition I ſuppoſe may not at all be required, in the manure of a light and hollow ſort of *Marl*, lately found by the worſhipful and induſtrious Improver, *George Pudſey* Eſq; of *Elsfield*: for in water it diſſolves almoſt as ſoon as *Fullers earth*, and is naturally of it ſelf ſo hollow and ſpungy, that one would think it were always in the very ferment, and may therefore be uſed at any fit time of year: of colour when dry, it is of a whitiſh gray, intermixed with ſand, and very friable, and may in all probability be the very ſame, with the *Marga candida arenoſa friabilis*, of *Hildeſheim*, mention'd by *Kentmannus* [s], and out of him by *Lachmund*. Of juſt ſuch another *Marl* as this, brittle and duſty when dry, but fat when wet, we are inform'd there is at *Wexford* in the Kingdom of *Ireland*, by D^r *Gerrard Boat* [t] ſometime Phyſitian there; only that *that* is blue, and *this* a whitiſh gray, and may therefore be fitter for Paſture than Arable. It being obſerved in the Counties of *Suſſex* and *Kent*, where *Marls* are moſt plenty of any places of *England*, that the *gray* ſuit with Paſtures, and the *blue* (ſuch perhaps as Sir *Thomas Pennyſtons*) with Arable beſt.

11. It may therefore be expedient, that theſe new found *Marls* be thus agreeably tryed, and though they anſwer not expectation the firſt year, as ſome ſay they will not [u], let not their *Owners* be thus diſcouraged, but ſtill continue to make frequent tryals, of divers proportions of Earth, at all ſeaſons of the year, with all kinds of Grain upon all ſorts of Soil, till they find out the moſt ſuitable and neceſſary circumſtances, ſo ſhall they in time attain to a knowledge beyond the expectation, and perchance imitation of their Neighbors. But I forbear to inſtruct ſuch *Ingenious Perſons*, as the *Owners* of the above-named Marl-pits are: the *Orator* being accounted little leſs than a fool, that went about in his Speech to teach *Hannibal* to fight.

12. But beſide theſe, we have another ſort of Earth, of a fat cloſe texture, and greeniſh colour, ſo well impregnated with ſome kind of *ſalt*, that put in the fire, it preſently *decrepitates* with no

[s] *Kentman. nomenclat. rer. foſ. cap* 3. *de Margis.* [t] Boats *Nat. Hiſt. of* Ireland, *cap.* 12. [u] *Plin. Nat. Hiſt. lib.* 17. *cap.* 8.

leſs

leſs noiſe than *ſalt* it ſelf; and in *water*, after a quick and ſubtile ſolution, leaves behind it a kind of brackiſh taſt, which I thought might proceed from a ſort of *Vitriol*, and perhaps true enough, though the water would not tinge with powder of galls: it takes greaſe out of cloaths extreamly well, and would it but whiten, as *Fullers earth* doth, I ſhould not doubt to pronounce it the ſame with the *viridis Saponaria*, found near *Beichling* in *Thuringia*, and mentioned by *Kentmannus* in his collection of *Foſſils* [w]. This we have in great plenty in *Shot-over Foreſt*, where 'tis always met with before they come to the *Ochre*, from which it is ſeparated but by a thin *Iron cruſt*, and may peradventure be as ſtrickt a concomitant of *yellow Ochre*, as *Chryſocolla* (another green Earth) is ſaid to be of *Gold*. At preſent 'tis accounted of ſmall or no value, but in recompence of the ſignal favors of its preſent *Proprietor*, the Right Worſhipful Sir *Timothy Tyrril*, who in perſon was pleaſed to ſhew me the *pits*, I am ready to diſcover a uſe it may have, that may poſſibly equal that of his *Ochre*. Which brings me next to treat of ſuch *Earths* as are found in *Oxford-ſhire*, and are uſeful in Trades.

13. And amongſt theſe the *Ochre* of *Shotover*, no doubt, may challenge a principal place, it being accounted the beſt in its kind in the world, of a yellow colour and very weighty, much uſed by *Painters* ſimply of it ſelf, and as often mix'd with the reſt of their *colours*. This by *Pliny* [x], and the *Latines*, was anciently called *Sil*, which we have now changed for the modern word *Ochra*, taken up as ſome think from the colour of the *Earth*, and the Greek word ὠχρὸς, *Pallidus*; or as others, and they perhaps more rightly, from the River *Ochra* that runs through *Brunſwick*, whoſe Banks do yield great quantities of it [y]; and from whence in all likelyhood we received the name, upon the arrival of the *Angles* and *Saxons* in *Britan*.

14. They dig it now at *Shotover* on the *eaſt* ſide of the *Hill*, on the right hand of the way leading from *Oxford* to *Whately*, though queſtionleſs it may be had in many other parts of it; The *vein* dips from *Eaſt* to *Weſt*, and lies from ſeven to thirty feet in depth, and between two and ſeven inches thick; enwrapped it is within ten folds of *Earth*, all which muſt be paſt through before they come at it; for the *Earth* is here, as at moſt other

[w] *Cap.* 1. *De terris.* [x] *Plin. Nat. Hiſt. lib.* 33. *cap.* 12. [y] *Encelius de re Metal. lib.* 2. *cap.* 20.

places,

places, I think I may ſay of a *bulbous* nature, ſeveral folds of divers colours and conſiſtencies, ſtill including one another, not unlike the ſeveral coats of a *Tulip* root, or *Onyon*.

The 1. *next the turf, is a reddiſh earth.*
2. *a pale blue clay.*
3. *a yellow ſand.*
4. *a white clay.*
5. *an iron ſtone.*
6. *a white, and ſomtimes a reddiſh Maum.*
7. *a green, fat, oily kind of clay.*
8. *a thin iron-coloured rubble.*
9. *a green clay again.*
10. *another iron rubble, almoſt like Smiths cinders.*

And then the *yellow Ochre*, which is of two parts.

1. The *ſtone Ochre*, which we may alſo call native, becauſe ready for uſe as ſoon as 'tis dug: and
2. *Clay Ochre*, which becauſe of the natural inequality in its goodneſs, they waſh and ſteep two or three days in water, and then beat it with clubs on a plank into thin *broad cakes*, of an equal mixture both of good and bad; then they cut it into ſquares like Tiles, and put it on hurdles laid on treſtles to dry, which when throughly done 'tis fit for the *Merchant*.

15. Where perhaps by the way it may be worthy our notice, how different either the *Ochres*, or *opinions* of men concerning them, are now, from what they formerly were: for whereas *Dioſcorides* (as quoted by *Wormius*[z]) commends to our choice the lighteſt *earthy Ochre*, highly before the other of *ſtone*: We on the contrary, and not without reaſon, prefer the *ſtone Ochre* as far before the *clay*.

16. I was told of a *yellow Ochre* ſomwhere between *Ducklington* and *Witney*, that ſerves them thereabout for inferior uſes; and met with it beſide at ſome other places, but none ſo good as this at *Shotover*; that at *Garſington* being full of blue ſtreaks, and a ſmall parcel (that was ſhewn me) taken up about *Pyrton* intermixed a little too much with red, as if it were now in the tranſmutation (ſo much ſpoke of by *Naturaliſts*) by the *earth* and *ſuns* heat; firſt into *Rubrick*, or *Ruddle*, and thence at laſt into *gnigitis*, or elſe *black chalk*.

[z] *Ol. Wormii Muſæum. cap. 4.* [a] *Encel. de re Metal. cap. 20.*

17. Now

17. Now that *Nature* indeed proceeds in this *method*, I am almoſt perſwaded by what I have found in *Shotover-hill*, and elſewhere near it: for within two beds next under the *Ochre* (nothing but a white Sand interceding) there lies another of a much *redder hue*, which firſt receiving the ſteams of the *earth*, is now in the way of becoming a *ruddle*, and in proceſs of time when it grows *aduſt*, may at laſt make a change into a *black chalk*; which I ſhould not ſo eaſily have been induced to believe, but that at *Whately* Towns end, near the foot of the hill, where lately ſome attempts were made for *Coal*, they met with a vein of ſuch kind of *chalk*, which perhaps long before might have been nothing but *ruddle*, and as long before that, a *yellow Ochre*. But whether Nature proceed thus or no; or ſuppoſe theſe are not (as ſome have thought) the ſeveral gradations of the ſame individual, yet however, I ſhall not be guilty of miſ-placing, ſince all three belong to the *Painters* Trade.

18. To which may be added a ſort of *Cæruleum*, which in *Engliſh* we may render *native blue*, becauſe naturally produced by the ſteam of ſome *Mineral*, latent under the afore-mentioned *Marl* at *Blunds-Court*, amongſt which it is found in very good plenty; but yet ſo thinly coating the little cavities of the *earth*, and ſome other bodies (of which hereafter) to which it ſticks, that no quantities can be gotten for the *Painters* uſe, for whom it would otherwiſe be very fit, as upon tryal has been found by the worthy M^r *Stonor*. *Kentmannus*[b] indeed tells us of a cinereous ſort of *Earth* ſomwhere near *Padua*, that affords ſuch a *blue*; but I gueſs that ours cannot be (nor perhaps is that) the immediate production of the ambient *Earth*, but rather of ſome *mineral* or *metal* below it; of which more at large in a fitter place.

19. Hither alſo may be referr'd a gritty ſort of *Umbers*, found in all parts of the *County* where there are Quarries of Stone: a courſer kind of them I met with near *Witney*, and a ſomwhat finer at *Bladen* Quarry; theſe ſomtimes are found in the ſeams of the *Rocks*, and ſomtimes again in the body of the *Stone*; and notwithſtanding their gritty *texture*, yet prove uſeful enough to *dreſſers* of Leather. But yet a much finer than either of the former, has been lately taken up at *Waterperry*, in the ground, and near the Houſe of the Right Worſhipful Sir *Thomas Curſon*, of ſo

[b] *Kentmann de terris, cap.* 1.

rich and beautiful a colour, that perhaps it might better have been placed among the *Ochres*, but that mix'd with Oyl, it turned darker than that they call *Engliſh*, and much more ſo than the *ſpruce-Ochre* of *Shotover Foreſt*.

20. Beſide theſe, we have another *fine Earth*, of a white colour, porous and friable, inſipid and without ſcent, diſſoluble in water; and tinging it, of a milky colour, and ſomtimes raiſing a kind of ebullition in it; found frequently in the liſſoms or ſeams of the Rocks, or ſticking to the hollow roofs of them: in ſhort, ſo altogether agreeable to what *Conradus Geſner* [c] (and out of him *Boetius de Boot*, *Calceolarius*, *Aldrovandus*, and *Olaus Wormius*) calls *Lac Lunæ*, that I could not but think it the very ſame. And to put all out of doubt, I tryed the Experiment of *Daniel Major* (who wrote no leſs than a whole Treatiſe concerning it) and found according to him, that with *Lacca*, though I could get none good, it gave the skin ſo florid a whiteneſs, that I dare pronounce it a good *Coſmetick*, and upon that very ſcore have given it place here.

21. I obſerved it firſt near the *Worceſter road*, about mid-way between *Holton* and Sir *Timothy Tyrrils*, where the Stones taken up, for I know not what uſe, as alſo at ſome places in *Whately* field, were all in a maner covered with it. And I met with it again near *Haſeley*, in the fields between that and *little Milton*, and quickly after at *long Hanborough*, upon ſtones provided for walling there: I enquired of the Quarry-men what it might be, whether they had made any uſe, or obſervations of it, but all I could get would amount to no more, but that it was a ſign of a very good *Lime-ſtone*.

22. Which alſo it ſeems is its *character* amongſt our Neighbors in *Ireland*, where (we are [d] told) the beſt *Lime-ſtone* is of a gray colour, and if broken, has a white duſt that flies away from it. But if we may believe *Olaus Wormius*, 'tis a ſign alſo of ſomthing much better than that, who apprehends it to be nothing leſs than a certain effect of *Metallick vapors*: *Oritur*, (ſaies he, ſpeaking of *Lac Lunæ*) *à vaporibus metallicis, qui indies ſubtiles vehunt exhalationes, quæ ubi per ſaxa in cavitates exſudaverint, humido evocato, quod ſiccum eſt remanet & in medullam hanc raram, teneram, & friabilem concreſcit.* [e] To which *Daniel Major* not only agrees, but

[c] *De figuris Lapidum, cap.* 6. [d] Boats *Nat. Hiſt. of* Irel. *c.* 20. *ſect.* 4. [e] *Ol. Wormii Muſæum, cap.* 4.

more

more particularly adds, that the matter of this Earth proceeds from the *metallick vapours* of *ſilver ore*, by ſome fermentation raiſed and ſublimed, and then condenſed on the ſides of the Rocks.

23. Of which, ſays *Geſner*[f], there are two ſorts; the one *groſs* and *gritty*, becauſe immature and crude; the other more perfectly concocted, *whiter*, *lighter*, and *ſofter*: And of both theſe we alſo find here, but whether indicative of *ſilver ore*, as in the mentioned places by *Johan: Daniel Major*[g], is the great queſtion. In anſwer whereunto I cannot but add, that though I ſhould be very unwilling, that any *Owner*, *Farmer*, or *others*, ſhould hazard their Fortune upon my weak judgment, without the advice of ancient and experienced *Bermen*; yet that at *Shotover*, beſide *Lac Lunæ*, there are other Symbols of *ſilver Ore*.

24. Whereof, if any heed may be given to *Pliny*, the *Ochre* before-mention'd may be accounted one: *In argenti & auri metallis naſcuntur etiam optima pigmenta Sil & cæruleum*; where by *Sil* he means ſuch yellow *Ochre*, than which, there is no place we know of in the world that has greater plenty, or of equal worth. To which we may add a ſort of *Iron-ſtone*, which is not *Iron-ore*, found peradventure in as great quantities here, as it is upon the hills near *Schemnitz* in *Hungary*, the greateſt *Mine-town* in that *Kingdom*: where it ſeems it is not only a ſign of the *Ore*, but is alſo of great uſe in melting of it; whereof ſaies Dr. *Brown*, in his Journey thither, that of a liver-colour is counted beſt[h]. Now that we have ſuch an *Ore*, though I dare not promiſe, yet provided we had in the greateſt plenty, the liver-colour'd *Iron-ſtone* (I dare ſay it) would not fail us.

25. But if *Lac Lunæ* alone may be a ſufficient *Index*, and if we are not miſtaken in the thing it ſelf, as I verily think we cannot be, none of the places already mention'd can ſhew it in quantity and goodneſs too, equal to a Quarry in the Pariſh of *Cornwell*, *ſouth weſt* and by *weſt* about a hundred yards from the Right worſhipful Sir *Thomas Pennyſtons* houſe; where it is found ſo well concocted, and of ſo great purity, that the driven Snow never appeared whiter; and yet in ſo great quantity too, that I cannot gueſs the *Mineral*, or whatſoever other *metal* it be, that

[f] *De figuris Lapidum, cap.* 2. [g] *De Lacte Lunæ diſſertatio Medica. Edit. Anno* 1667. [h] Account of his Travels. pag. 92.

gives ſo great a ſteam as this, can lie very deep, or be very poor: Yet I ſhall not preſume to adviſe its *owner*, the eminent *Virtuoſo* Sir *Thomas Pennyſton*, any further to dig in queſt of it, than according as he ſhall want Stone upon other occaſions, to ſink his Pit for the future, *perpendicular* to the *Horizon*, whereas now he takes it as it riſes *in plano*: So that in time, when he is gotten through the Rock, a more certain judgment may be paſt on what lies under, with little charge or damage to *him*: Where if in time he finde a Treaſure, I am ſure the *Diſcoverer* will not want his reward, from ſo Ingenious, and every way ſo accompliſh'd a *Perſon*, at leaſt in ſuch proportion as has alwaies been allowed by the *Societies* of the *Mines Royal*, and *Mineral Battery-works*.

26. Beſide the notice it gives of *Mines*, and uſe it has in covering the blemiſhes of the *Face*, like the Earth *Quei* of *China*, mention'd by [i] *Kircher*; its *Medicinal* uſes are very great. For by *Georgius Agricola*, and *Fernante Imperato*; the former whereof calls it *Stenomarga* [k], and the latter *Agaricus Mineralis* [l]: it is thought to have the virtues of the *Samian* Earth, and to be very beneficial in ſtopping of blood, and womens diſeaſes. *Boetius* [m] holds it to be a good *narcotick*, and that it ſafely may be given to procure ſleep. And *Geſner* [n] affirms it to be commonly ſold by the *Apothecaries* of *Lucern*, and uſed by *Chirurgians* to dry gleeting ſores; and that given to Nurſes, it increaſes their milk, and quickly makes their Breſts apparently ſwell. And upon this account it ſerves me as a ſeaſonable tranſition to paſs next to the *Earths* of *Medicinal* uſe.

27. Of which the moſt likely I have met with yet, is dug amongſt the clay they uſe for bricks, in the Pariſh of *Nettlebed*, not far from the Wind-mill, of as red a colour as *Bolus Armenus*, but not like that diſcolouring the hands; ſtrongly *adhering*, if put to the tongue, but whether *provocative* of ſweat or no, I have not hitherto been able to perſwade a tryal. However, let it prove never ſo good, I'le not promiſe the *owner* any great profit, becauſe of the humor we have of deſpiſing our own, and only admiring and eſteeming thoſe things that are far fetched and dearly bought.

28. But quite of another mind was that famous Phyſitian,

[i] *China illuſtrata.* [k] *De Natur. Foſſil.* [l] *Dell' Hiſt. Natural. Lib.* 5. *cap.* 4. [m] *De Lapid. & Gemmis. cap.* 229. [n] *De Figuris Lapidum, cap.* 2.

Mr. *Henry*

Mr. *Henry Sayer* of *Magdalene College Oxon*, who commonly made uſe of a cinereous Earth, ſomwhat tending to yellow, and finely *chamletted*, that he found at the Quarries, in the *gullies* of the Rocks in the Pariſh of *Heddington:* with which, as I am informed by my worthy Friend Mr. *Croſs* once his *Apothecary*, and ſtill living, he did as frequently, and as well procure Sweats, as with any of the Forreign *earths* whatever.

29. To theſe may be added a whitiſh fat *earth*, formerly of ſome uſe in *external applications*, which they fetch'd, whil'ſt the *waters* continued in requeſt, from the orifice of the afore-mentioned *ſpring* at *Goreing*, and phanſied it at leaſt, to be a very good remedy for the *ach* of Corns, and ſome other ſuch *maladies*: but as ſoon as the *waters* began to fail, the *earth* too (though ſtill there remain enough) began to decline in its reputation, and is now of very little, if of any eſteem.

30. There is another white *earth* of ſome uſe in this Country, which ſome will have alſo, as well as *Lac Lunæ*, to deſerve the name of a *mineral Agaric:* it grows for the moſt part within round hollow Flints, to be had almoſt every where in the *Chiltern* Country, and good to ſtop fluxes boiled in milk; and I was told by an eminent Phyſitian, has been uſed in Conſumptions with good ſucceſs. The ſtone in which it grows they call here a *Chalk Egg*, and is the ſame with the *Geodes* of the ancient *Naturaliſts*, of which, becauſe further in the *Chapter of Stones*, I forbear to add more concerning it here.

31. Hither alſo muſt be referred not only the *earths* that are found to be ſoveraign for Mans preſervation, but according to the *Logical* rule of *contraries*, ſuch as often have been his deſtruction too: Whereof there are ſome in the Pariſh of *North Leigh*, that ſend forth ſuch ſudden and deadly ſteams, that they kill before the *Patient* can give the leaſt notice, of which they have had two very deplorable examples.

32. The firſt whereof happened in *Auguſt*, about twenty years ſince, when two men of the place imployed to dig a well, firſt ſickned, and wiſely withdrew from the work: whereupon it was undertaken by two others of *Woodſtock*, men of greater reſolution and leſs wiſdom; who before they could do any thing conſiderably in it, ſunk down and irrecoverably dyed in the well: which quickly being perceived by a woman above, a *Miller* hard

by

by was called to their assistance, who as unhappily as willingly descending to them, also suddenly fell down upon them, and dyed: To whom, after some deliberation taken, *another* ventures down with a roap about his middle, but he fell from the Ladder in just the same manner, and though presently drawn up by the people above, yet was scarcely recover'd in an hour or more.

33. And now again but lately, on the 20th of *August* 1674. upon a buckets falling casually into a well, on the *south* side of the *Town*, about a furlong from the former, a woman calls her neighbor, a lusty strong man, to go down by a Ladder to fetch up her bucket, who altogether unmindful of the former accident, soon granted (as it proved) her unhappy request; for by that time he came half way down, he fell dead from the Ladder into the water: the woman amazed, calls another of her Neighbors, a lusty young man of about eight and twenty, who hastily descending to give his assistance, much about the same place also fell from the Ladder, and dyed, without giving the least sign of his change, so suddenly mortal are the damps of this *earth*.

34. Dr. *Boat* [o], in his *Natural History* of *Ireland*, gives account of an accident that happen'd at *Dublin*, in a well there so very like ours, that they scarcely differ in any circumstance. And we have a relation in our *Philosophical Transactions* [p], of such kind of damps that happen'd in Coal-mines belonging to the Lord *Sinclair* in *Scotland*. Now though we must not conclude from hence, that here must therefore needs be *Coal*; yet, conjoyned with others I know hereabout, I take it not to be so unlikely a *sign*, but that of all others I know of in the *County*, I guess this may be the most probable place.

35. For though I think those poysonous and killing steams may indeed more immediatly have their rise from a *Pyrites*, or *Coperas stone*, found here in great plenty where-ever they dig; a piece whereof brought me by a friend from thence, upon tast, proved a *Vitriol* so strong and virulent, that presently from my mouth it so affected my stomach, that I confess for a while I was fearful of danger: yet, it being the common consent of *Naturalists*, that such *Pyrites* are nothing but the *efflorescence* of *Mine-*

[o] *Cap.* 18. *sect.* 4. [p] *Philos. Transact. Num.* 3.

rals,

rals, latent underneath them in the bowels of the earth, my conjecture thereby is not made the leſs valid.

36. With the *Pyrites cinereus*, or *Coperas ſtone*, not unlikely there may alſo be ſome mixture of *Arſenic*, which advances its malignity to that deadly ſtrength, that no man may approach under pain of death: But that for the future, the inſenſible invaſions of this ſecret enemy may for ever be avoided; let all *workmen*, and ſuch as upon any account whatever have occaſion to dig or go down in theſe wells, firſt throw down into them a peck of good *Lime*, which ſlaking in the water, and fuming out at the top, will ſo effectually diſpel all ſuch poiſonous vapors, that they may ſafely go down, and ſtay ſome time unhurt.

37. From theſe miſchievous ones of *Vitriol* and *Arſenic*, I proceed to ſome other more innocent *ſalts*, before promiſed more fully to be handled here, with which ſome *earths* being peculiarly qualified, are accordingly diſpoſed to *petrifie* bodies. How all *petrifications* are performed by *ſalts*, and *petrifications per minima*, by their ſubtileſt ſteams, I ſuppoſe has already ſufficiently been ſhewn, as alſo how *waters* moſt probably effect them: It remains only therefore now to be proved, that *earths* as well as *waters*, do afford ſuch ſteams as permeate alſo the moſt ſolid *texture*.

38. To which purpoſe I met with a curious inſtance in the Fields between *Clifton* and *Nuneham-Courtney*, of a ſtone that repreſents a ſound piece of Aſh, cut both parallel and tranſverſly to the pores, and retaining the grain and colour ſo well and lively, that no body at ſight believes it to be other than a firm and ſolid piece of wood; and yet this was taken out of grounds thereabout, as far from water as one need to wiſh. In ſhort, the verſion ſeems ſo very perfect, its ſubject appearing to have been very ſound and free from rottenneſs, that either we muſt own ſuch *petrifications* as this, to be truly ſuch, and *totum per totum*, or elſe allow that ſtones may grow in grain and colour exactly like wood.

39. But that the latter of theſe may not ſo far take place (though the poſſibility of the thing muſt not be denyed) as to exclude a poſſibility of its being ſomtimes otherwiſe; I take leave to inſtance in another *petrification* made alſo by an *earth*, and not by *water*, that ſeems to carry a neceſſity with it, of its ſubjects once being ſolid *wood*: for beſide, that it ſhews the cloſe grain of *Oak*,

and

and therefore by *Naturaliſts* called *Dryites*: it was taken up in great quantities too, and out of ſome of the pieces, (whereof I have one) it may be plainly ſeen where *twigs* have come forth, the knots ſtill remaining where they were cut off; ſo that unleſs we fly to the *ſports* of *Nature*, and allow *her* to imitate almoſt all things in ſtone, we cannot well avoid a conſent, that this was ſomtime really *Wood*. It was caſually dug up in the Pariſh of *Wendlebury*, in a gravelly ground not far from the Church, and is, I believe, the ſame Earth mentioned ſo good for this purpoſe in our *Philoſophical Tranſactions*[q].

40. Thus having conſidered the principal *Earths* uſed in *Huſbandry*, *Painting*, *Medicine*, *&c.* I proceed in the next place to treat of ſome others, leſs in value, and put to inferior uſes: Amongſt which we may reckon the very uppermoſt Turf; which beſide for *Bowling-greens*, and *Graſs-walks* in Gardens, is here not unfrequently uſed by *Thatchers*, and laid on *Mud-walls*, and the *tops* of Houſes, in the place and manner of thoſe we call *Ridge-tiles*; not that it is ſo good as *Thatching* (though ſome ſay it better reſiſts the winds) but becauſe in ſome places Wood is ſo ſcarce, that they cannot get *ſpraies* to faſten on *Thatch*; or elſe the people ſo poor that they care not to buy them.

41. Alſo at ſome other places for want of *Wood*, they make uſe of another ſort of *Turf* for fewel, not the upper *Green-ſword*, but an inferior ſtringy *bituminous Earth*, cut out like *Bricks*, for the moſt part from mooriſh boggy grounds; in ſome Countries called *Peat-pits*, in others *Moſſes*. The beſt of this Turf that I have ſeen in *Oxford-ſhire*, I met with at Mr. *Warcups* in the Pariſh of *North-Moor*, but dug as I was informed in *Stanton-Harcourt*, about a mile diſtance S. Weſt from the Church: it lies but one ſpits depth within the ground, and is ſuppoſed to be at leaſt four foot thick: They cut it in *March*, and lay the pieces called *Peats* to dry on the graſs, ſomtimes turning them; which when reaſonably well done, they then pile up like *Wheelwrights felleys*, leaving every where empty ſpaces between, that the Air and Wind paſſing through them, they at length may become dry enough for the fire. They think that the *ſtringy roots*, that together with the *Bitumen*, make up the *Peats*, do never flouriſh above the ſurface: if ſo, I am ſomthing confirmed in an opinion, that there are

[q] *Num.* 6.

many

many *ſubterraneous Plants* not noted, of which I intend a diligent enquiry [r]. After the *Peats* are taken out, they fill up the ground again with the graſſy *earth* that was firſt cut up. And at *Cowley*, where they alſo dig them, they uſually leave the depth of one *ſpade-graft* at the bottom, as a foundation whereon they may grow again, which in the ſpace of twenty or thirty years, 'tis obſerv'd they will do in the *North* of *England* * .

42. The ſcarcity alſo of fireing has induced ſome People to burn a ſort of *black ſubſtance*, of a grain ſomwhat like rotten wood half burnt, but participating alſo of a *Mineral* nature, and therefore by Authors called *Metallophytum*, or *Lignum foſſile* [s]: put into *water*, it will not ſwim; and into *fire*, it conſumes but ſlowly, and ſends forth very unpleaſant fumes: it is found in a Quarry called *Langford-pits*, in the Pariſh of *Kidlington*, not far from *Thrup*, about eighteen foot deep under the Rock, where there lies a bed about four inches thick. But at *Ducklington* I met with a much finer kind, and richer in *bitumen*; for though on the out ſide it looks like wood, yet broken, it ſhews a ſmooth and ſhining *ſuperficies*, not unlike to *ſtone-pitch*, and put in the *fire*, has not near ſo ill a ſmell. This was dug, and kindly beſtowed upon me by the Worſhipful *William Bayly* Eſq; who told me beſide of an *Aluminous earth* that he ſomwhere alſo found in his ground. As for the ſubſtance, *Lignum foſſile* it is thought to be originally a *cretaceous earth*, turned to what it is by *ſubterraneous heats*, which probably at *Kidlington* may indeed be great, becauſe reflected by the Quarry above it, for that it was never formerly wood, notwithſtanding its ſpecious and outward likeneſs, is plain, from its never being found with *roots* or *boughs*, or any other ſigns of wood.

43. At *Marſh Balden* Heath, and *Nuneham-Courtney*, they have a ſort of *earth* of ductile parts, which put in the fire ſcarcely cracks, and has been formerly uſed by *Potters*, but upon what account I know not, now neglected. There is alſo a Clay near *Little Milton* that might very well ſerve for the *Potters* uſe. And at *Shotover-hill* there is a *white clay*, the fourth fold of earth in the way to the *Ochre*, which during the late wars, in the ſiege of *Oxford*, was wholly uſed for making *Tobacco-pipes* there; and is

[r] *Vid. Nich. Stenonis Prodrom.* * They dig prety good Peats alſo near the *Wyke* at *Heddington*; and in a boggy ground Eaſt-ward of *Elsfield* Church. [s] *Ol. Wormii, Muſæum lib. 2. cap. 6.*

ſtill in part put to that ſervice, mixed with another they have from *Northampton-ſhire*. It is alſo of excellent uſe to *Statuaries*, for making *Moddels*, *Gargills*, or *Anticks*; and containing a hard, but very ſmall grit; in *poliſhing* Silver, it comes near to *Tripela*.

44. And ſo do's an *anonymous* very *white earth*, found in the ſeams of the Quarries at *Teynton*, which at firſt I concluded a *crude Alabaſter*, becauſe I found near it a piece that was perfect: but reducing it into a very fine powder, and putting it over a quick fire, it would not boil like *Alabaſter* duſt, nor keep the colour, but turned reddiſh. Many other tryals were made with it, in *Plaſticks*, *Poliſhing*, *Painting*, &c. but my endeavors ſucceeded in nothing ſo well, as in *poliſhing* ſmaller ſilver Veſſels, that could not endure *burniſhing well*; to which it gave a more glorious brightneſs than *Tripela* would, though perhaps not ſo laſting; and not far behinde that of burniſh'd Plate.

45. And yet neither this, nor the former will poliſh *braſs*, nor any thing elſe that is not of its colour, which has lately engaged my thoughts in a *Query*, whether in all other *Metals* the rule does hold: for I find, that *ſulphur* gives a luſter to *Gold*; and that nothing does brighten *Copper* ſo well, as a ſort of ſtuff they call *rotten ſtone*, alſo ſomthing of its colour.

46. At *Teynton* alſo, within a ſpit of the ſurface, they dig a ſort of earth they there call *Lam*, of a whitiſh colour inclining to yellow; which mixt with ſand, and ſome other earth, makes the beſt *earthen floors* for ground-rooms and barns: it diſſolves as quick as *Fullers-earth*, and were it not for a fault which might poſſibly be help'd, it may ſerve their turns perhaps as well as any they uſe.

47. To theſe may be added another *whitiſh earth*, which corruptly I ſuppoſe from its colour is called *Which-earth*; mixed with ſtraw, they uſe it for ſide-walls and ceilings, and with horſe-dung it makes mortar for laying of ſtones: it ſeems to be a natural mixture of *lime* and *ſand*, found at *Thame*, *Waterperry*, and *Adwell*, and ſlakes in water (like *Gypſum*) without any heat.

48. At *Milton* near *Adderbury*, *Great Tew*, and *Stunsfield*, I met alſo with another ſort of ſpungy chalk, which though it will not ſlake like the former; yet at *Milton* and *Adderbury* uſed for pointing, ſeems to binde the ſtones of their walls very well: and theirs at *Great Tew* being ſomwhat finer, ſerves as well to white their rooms

rooms within (as I ſaw at *Swerford*) as to point walls without: but at *Stunsfield* there was no body knew of its uſe.

49. Other earths there are that I find in this County, for whoſe *names*, as well as *natures*, I am quite at a loſs; whereof there is one in Sir *Thomas Pennyſtons* Park, which for the ſtrangeneſs of its qualities deſerves the firſt place. Of colour it is extreamly white, of little taſt, and leſs ſmell; lying in veins in a yellowiſh clay, like a *medulla* about the bigneſs of ones wriſt: taken out with a knife, it falls into a fine powder, ſomwhat gritty, but of ſo very great a weight, that its double at leaſt to any other *earth* of its bulk; put in the ſcale againſt *white Marble duſt*, it equall'd its weight, and exceeded that of *Alabaſter* by almoſt a fourth part: ſet in ſand in a glaſs retort, and driven with a quick and ſtrong fire, it ſublimed to the ſides of the glaſs a little, but ſtill preſerved its colour and weight, till put between two *Crucibles*, one inverted upon the other; well luted, and ſtrongly forced in a *wind-furnace* for about two hours, it loſt above the moiety of its weight: for as I well remember, of *three ounces* put in, there came not out full *one* and a *half*, and yet nothing ſublimed in the top of the *Crucible*: the colour ſtill remained as white as ever, and the bulk (as near as I could gueſs) the ſame, but now of a ſtrong *ſalt* and *urinous* taſt; which after ſolution, filtration, and evaporation, came at laſt, to what people as little underſtood, as what became of its *ponderous* ingredient.

50. We tryed it alſo at *Cornwell*, in Sir *Thomas Pennyſton's Laboratory*, becauſe of its weight with divers *fluxing ſalts*, in hopes of ſome kind of *metalline* ſubſtance, but all, as before, to little purpoſe. So that I cannot tell what to divine it ſhould be, except the *Gur* of the *Adeptiſts* congealed, which they deſcribe in their Books to be much ſuch a thing, which for want of more time to ſpend in its ſervice, I leave to the diſcovery of future ages.

51. In the Chalk-pits almoſt every where in the South-eaſt parts of *Oxford-ſhire*, they finde a ſort of iron-colour'd *terra lapidoſa*, in the very body of the *chalk*, which I think they call *Iron-moulds*, and particularly at a place between *Brightwell* and *Berrick*, of an oval figure: how they came to be of that ſhape, or at all grow, in a ſubſtance of ſo different a nature as *chalk*, I confeſs to be a *problem* beyond my knowledge, as well as the

uſe they may probably have, which I alſo remit to poſterity to find.

52. They have an earth about *Teynton* of a yellowiſh colour, adorned all over with *glittering ſparks*, which unleſs they are particles of the *ſpecular ſtone*, or Engliſh *Talc*, with the former muſt be reckoned amongſt the unknown *earths*.

53. To which add another kind of *terra lapidoſa* found about *Thame*, at the bottom of their Quarries, it is much of the colour of the *Turkiſh Ruſma*, hollow and ſpungy, and full of ſhining grains like a ſort of *Pyrites*, but of what nature or uſe I can no where find. Nor of another ſort of *Clay* found at *Hampton-Gay*, holding a grit of a golden colour, much of the nature of *Pyrites aureus*, only 'tis not found like that in great pieces, which by our modern Naturaliſts are called *Braſs lumps*.

54. And thus I had concluded the *Chapter of Earths*, but that I think it belongs to this place to mention alſo ſuch accidents as attend them; and therefore muſt not be altogether ſilent of an eminent *Proſpect* about a mile from *Teynton*, where from a Hill *North-eaſt* from thence, ten *Mercat towns* in a clear day may plainly be ſeen. Nor of a ſmall *Earth-quake*, that on the nineteenth of *February*, 1665. was obſerved at divers places near *Oxford*; as at *Blechington*, *Stanton St. Johns*, *&c.* But it ſhall ſuffice juſt to mention it, Relations (with the *concomitants*) of it, being already publiſhed: [t] one by the Honorable *Robert Boyle* Eſq; and the other by the Learned Dr. *John Wallis*.

[t] *Philoſ. Tranſact. Num.* 10, 11.

CHAP.

CHAP. IV.

Of Stones.

AS in the Chapters of *Waters* and *Earths*, I treated only of ſuch as eminently held ſome *ſalt* or *ſulphur*, and were ſome way or other uſeful to *Man*: I intend in like manner in this of *Stones* ſtrictly to obſerve the ſame *method*, and take notice only of ſuch as either plainly ſhew thoſe *Minerals*, and ſupply the *neceſſities*; or are for the *ornament*, or *delight* of Mankind.

2. How all *ſtones* are chiefly made out of *ſalts*, with a mixture of *earth* and ſomtimes of *ſulphur*, was formerly hinted in another place. It remains only that I conſider them in a more particular manner, and ſhew which they be, and where they are, that hold any of theſe principles more ſignally than other, which I ſuppoſe by their effects may beſt be diſcover'd.

3. In the Road from *Oxford* toward *London*, not far beyond *Tetſworth*, in a hollow way on the riſing of a hill, I found a ſoft ſtone there-about called *Maume*, of a whitiſh colour; whoſe *ſalt* is ſo free from the bonds of *ſulphur*, that with the froſts and rain it flakes like *lime*: perhaps half the firing uſed to burn away the *ſulphur* in other *lime-ſtone*, might ſerve the turn here. An Experiment ſo very likely to be beneficial to the *Country*, that I left it with the Son of the ingenious Improver, Sir *Thomas Tipping*, as a thing not unworthy of his Fathers tryal; but whether he have at all, or but unſucceſsfully made any, I have not yet had the favor to hear.

4. In the way to *Whitfield*, as I rod thither from *Tetſworth*, I found the ways mended with this kinde of *ſtone*, I ſuppoſe becauſe they could get no other, for certainly otherwiſe there were nothing more unfit, than a ſtone of ſo looſe and open a *ſalt*: much rather with ſuch ſhould they mend their Lands than Highways, that like *lime*, *marles*, and *chalk*, will flake in the Winter; which I take for ſo ſure a mark of its *improving* quality, that I cannot but commend it to the tryal of the *Country*.

5. And for their encouragement, let me farther tell them, that at a place called *Hornton* in the North of this County, they commonly

monly uſe the *chippings* of the *ſtone* dug there in the Quarry, for *improvement* of the Land, and that not without apparent ſucceſs: and yet the ſtone is of a much harder kind, than this at *Tetſworth* and in the way to *Whitfield*.

6. Amongſt ſome MSS. notes of *Natural things*, I met with one of a ſtone at *Oriel College*, commonly called (ſays the Author) *The ſweating ſtone*, at which the Birds were conſtantly pecking and licking; as I gueſs (if ever there were any ſuch thing) for ſome kind of *ſaltneſs* they found come from it: I ſay, if ever there were any ſuch thing, for I find it not in this *new*, nor remains there any tradition of it in the *old College*. I therefore paſs it by without further notice.

7. However, in ſhort, all ſtones have ſo much *ſalt* in them, that in ſome meaſure they are an *improvement* of Land, for though it be ſo cloſe lock'd up with *ſulphur*, that the greateſt froſts and rain will not make the ſtones run, yet there is ſtill ſuch an emiſſion of *ſaline* ſteams, that ſome *earths* have their whole fertility from them. Thus have I ſeen Fields cover'd with Flints and Pebbles, produce better Corn than where there were none, which perhaps may be a better reaſon than what is brought by *Pliny* [u], why the Foreign *Coloni* that came to *Syracuſe* to inhabit there, and practiſe Huſbandry; after they had cleared the ground of all the ſtones, could have no Corn, till they had laid them again on the very ſame ground from whence they had taken them but juſt before.

8, The like may be obſerved in *walls and buildings*, where ſeveral ſorts of *vegetables*, yea *trees* of great bigneſs, will thrive and proſper remote from the *earth*, without any further nouriſhment, than that they have from the *fertile ſtones*, and *lime* they are laid with, alſo made out of *ſtones*.

9. If it be objected that *Pebbles* and *Flints* alſo hold a *ſulphur*, as well as a *ſalt*, and that in all probability Corn and other Vegetables may receive their flouriſhing verdure, rather from the warm comfortable ſteams of that, then the others of *ſalt*, I ſhall not ſo much as contend about it, but gladly accept of the opportunity by this means to paſs from *ſtones* holding *ſalt* only, to ſuch as have alſo a mixture of *ſulphur*.

10. And ſuch are all that with *ſteel*, or any other fit body,

[u] *Lib.* 17. *cap.* 4.

will

will ſtrike fire, and therefore by a very fit name called *Pyrites*, under which *genus* may be reckon'd not only *Pyrites* ſtrictly taken, but *Flints*, *Pebbles*, *Sand*, and whatever elſe by any quick and ſudden attrition may have its parts kindled into ſparks: of which as many as I find eminent in their kind, or are fit for uſes, as briefly as may be.

11. And amongſt them (as I think moſt due) for the prerogative of its colour, I aſſign the firſt place to the *Pyrites aureus*, or golden fire-ſtone, whereof they find great plenty in digging of Wells about *Banbury* and *Cleydon*, and ſomwhere in the River at *Clifton* near *Dorcheſter*: Some of them are taken up in great lumps (and are therefore alſo called *Braſs-lumps*) of uncertain form, whereof I had very rich ones out of the Well of one *Boreman* of *Cleydon*. But thoſe from *Clifton* aforeſaid ſeem to be *laminated*, and ſome of them ſhot into angles like *Briſtol Diamants*, and are mentioned by *Aldrovandus* [w], which he calls, *Pyrites cum fluoribus adnaſcentibus*, and *cujus partes cohærent tanquam lapilli anguloſi*. Theſe ſtrike fire in great plenty, and for that reaſon formerly have been much uſed for *Carabines* and *Piſtols*, whil'ſt *Wheel-locks* were in faſhion; and are alſo very weighty, and perhaps hold *metal*, which, were it not for the too great proportion of *ſulphur* (whence ſuch Minerals, ſaith the Learned *Willis* [x], have chiefly their concretion) that carryeth it away while it melteth in the *Crucible*, by over-*volatilizing* it, which the *Mine-men* therefore term *the Robber*, might otherwiſe be procured with advantage to the *owner*.

12. At *Aſton Rowant*, *Nettlebed*, and *Henly*, and indeed all along the *Chiltern* Country, they have another ſort of *Marchaſite*, within ſide of a golden, and without of a darkiſh ruſty colour, and therefore at ſome of the afore-mentioned places called commonly *Crow-iron*: this ſort, if broken and laid in the air, or any other moiſt place, diſſolves into a *ſalt* that taſtes like *ink*, and is no queſtion the *Pyrites* of *Kentmannus* [y], which for that reaſon he terms *atramenti parens*. And ſuch a one is the *Pyrites* found at *North-Leigh*, brought me thence by my worthy Friend Dr. *Perrot*, which not only like the former gave the taſt of *ink*, but expos'd to the *air* awhile, became cover'd with a white downy *ſalt* of the very ſame taſt, which I take to be ſuch a natural *atramentum*

w *Lib.* 4. *cap* 3. x *De Ferment. cap.* 9. y *Tit.* 2. *cap. de Succis efflorescentibus.*

album,

album, as is ſaid by the ſame *Kentmannus*, *Efflorescere è pyrite Goſlariano, & Radebergenſi*[z].

13. Next to theſe, in order of nature as well as dignity, comes the *ſilver Marchaſite*, under conſideration of a white gliſtering colour, and to be had in the bottom of the River between *Clifton* and *Burcot*: this ſtrikes fire as well as the *golden Pyrites*, but notwithſtanding it was expoſed in the fitteſt places, yet would never, that I could perceive, ſend forth any *efflorescence*. Another ſort of them I met with at *Deddington*, taken out of the afore-mentioned *ſulphur* Well there, of as glorious a colour as the former; but ſeveral times tryed on the beſt Steel I could get, would never yield the leaſt ſpark of fire: whence I rather concluded it to be *argentum felium*, or *Cat-ſilver*, but that it would not ſhine in the dark, or conſume in the fire: However, it may paſs for a *ſterile nitidum*, ſo often mentioned by *Naturaliſts*, it being a glorious *nothing*, of no kind of uſe.

14. That *Flints*, *Pebbles*, and *Sands*, are alſo *Pyrites*, needs no further evidence than that they ſtrike fire, a thing ſo obvious to the meaneſt Obſerver, that to ſpend time to prove it, would be loſt time to the *Reader*; it ſhall ſuffice therefore to enumerate the ſeveral kinds of each, and chiefly to inſiſt upon ſuch as have uſes.

15. All along the *Chiltern* Country of *Oxford-ſhire*, *Flints* are as plentiful as any where elſe; amongſt them the black one, well poliſh'd, will ſupply the place of the *Lydian ſtone*; and at *Henly* they uſe them in making of Glaſs, of which more anon in the *Chapter of Arts*. They are found beſide of divers other colours, and ſome of them ſo *tranſparent*, that they ſeem not only to imitate, but to be the very ſame with *Achats*. I have one, found at *Dorcheſter*, about an inch and half ſquare, of a *fleſh colour*, and ſo *tranſparent*, that it may well enough deſerve the name of *Sardachates*. Such as this were alſo ſhewn me, by the truly Ingenious, the Right Honorable *James* Lord *Norreys* of *Ricot*, and found, as I think his Lordſhip told me, ſome where thereabout, and are I do not queſtion the very ſame ſtones, that *Kentmannus*[a] indeed places in his Title of *Flints*, yet calls them, *Pellucentes Sardæ colore*.

16. Of *Pebbles* there are ſome alſo *tranſparent*, to be had a-

[z] *Tit. 2. cap. Sory, & de ſuccis efflorescent.* [a] *Kentman. tit. 8.*

bout

bout *Finſtock* and *Nuneham-Courtney*; I found them alſo in the way between *New-yate* and *Enſham*, but none comparable to what was ſhewn me by that great *Virtuoſo*, the Right Worſhipful Sir *Anthony Cope* of *Hanwell*, the moſt eminent *Artiſt* and *Naturaliſt* while he lived, if not of *England*, moſt certainly of this *County*, whoſe Houſe me thought ſeemed to be the real *New Atlantis*, which my Lord *Viſcount Verulam* had only in fanſie. The *Pebble* I remember was about the breadth of ones hand, of a flat form, and yet not much leſs than an inch in thickneſs, ſo clear and pellucid, that no *Chryſtal* that ever I ſaw yet excell'd it; ſo that had not its *Maſter*, the cautious *Artiſt*, took care to leave on it part of its outward coat, few would have believed it had ever been a *Pebble*.

17. Theſe *Pebbles* when *tranſparent*, make an excellent ingredient for the *Glaſs-works*; and ſo do thoſe which are *white*, though not *tranſparent*, called by ſome Authors by the name of *Quocoli*, and perhaps not much different in nature from the *Cuogolo* of *Ferrante Imperato* [b], and ſuch are the *Pebbles* gathered at *Teſino* [c], with which they make the pureſt Glaſs at the *Moran*.

18. There are about *Goreing* and *Nuneham-Courtney*, a ſort of *Pebbles* of a *blue-black* colour, that if poliſh'd, might ſupply the place of *Touch*. And about *Fawler* and *Stunsfield* are a reddiſh kind, very hard, and for the moſt part of an oval Figure, ſo excellent for pitching of *ſtreets* and *ſtables*, and for Painters *mullars*, that none can be found more fit and durable.

19. After conſideration of *Flints* and *Pebbles* apart, let us now take a view of them jointly together, for ſo I found them at *Caverſham*, and *Greenvil*, and in the way from *Puſhill* to *Stonor-houſe*, in cluſters together of divers colours, and united into one body, by a *petrified* cement as hard as themſelves, and moſt of them I believe capable of *poliure* *. But the beſt of all are in the Cloſe at *Stonor*, of which there are ſome ſo large and cloſe knit, that could the Ingenious Proprietor, *Thomas Stonor* Eſq; find a way to ſlit and poliſh them without too much charge, he might make him rich *Chimney-pieces* and *Tables* of them, ſo far excelling *Porphyrie* and *Marble*, that perhaps they might compare with the beſt *Jaſper* or *Achat*. For I have ſeen ſuch as theſe found about *Hampſted*, curiouſly wrought into handles of

b *Dell' Hiſt. Nat. lib.* 24. *cap.* 16. c *Anton. Neri, lib.* 1. *cap.* 2. * There is a Quarry of this South of *Wolvercot* Church, but the Cement ſo ſoft, that it will not polish.

knives by that eminent Artiſt Sir *Anthony Cope*; to which few *Achats* might be compared, perchance none preferr'd, either in the poliſh or variety of colours.

20. The Ingenious Mr. *Ray*, amongſt other Obſervations made in his Journey through *Italy*, *&c.* tells us, That in the Church of the *Benedictines* at *Ravenna*, the *Monks* did ſhew him two *Marble pillars*, for which they ſaid, the *Venetians* offer'd them no leſs than their utmoſt weight in Silver. But the like he ſays, he had ſeen elſewhere, at the Library at *Zurich*, and at *Verona* in our *Ladies Chappel*, in the Garden of *Seignior Horatio Guiſti:* their generation at firſt, ſays he, was out of a maſs of ſmall Flints and Pebbles, united by a *cement* as hard as themſelves, and capable of *poliure*; which *cement*, he gueſſes, was ſeparated by degrees from a *fluid* wherein the ſtones formerly lay: which I take to be a deſcription ſo agreeable to ours, that nothing more need be ſaid to promote their tryal.

21. Hither alſo muſt be reduced a courſer ſort of *Smiris*, dug up in the pits at *Whately* Towns end, of a cinereous colour, hard and rough, and ſtriking fire as well as a Flint. The beſt ſort of *Smiris* ſerves for ſeveral uſes; but ours is fit only to cut the harder ſort of ſtones, that the ſand commonly uſed will not ſo well do, and perhaps for ſome other inferior uſes.

22. And to theſe muſt be added the ſeveral ſorts of *Sands*, which upon violent motions all ſtrike fire, and are commonly, and ſomtimes promiſcuouſly uſed, for *Building*, *Hour-glaſſes*, and *cutting* of Stone. But ſome there are of a more peculiar and conſiderable uſe, and ſuch is that dug in the Pariſh of *Kingham*, which after 'tis waſhed and duly ordered, ſo perfectly reſembles *Calis-ſand*, that it ſerves and is ſold for the very ſame: it is not found in every place, but they have ſigns (like *Miners*) to know where it lies; *viz.* a ſort of ſtuff that looks almoſt like *rotten wood*, which if they meet with under the Turf, they ſeldom fail of the Sand a little deeper; which they firſt cleanſe from rubbiſh, and the greater ſtones, by putting it through a courſe ſieve, then they waſh it in a trough and lay it a drying; which when ſufficiently done, they ſeparate again by a finer ſieve, the courſer part of it from the finer: the courſer ſerves for wheting of *ſithes*, but the finer ſort for ſcouring *pewter*, for which purpoſe it ſeems 'tis ſo very excellent, that the Retailers ſell it for a penny a pound,

pound, which amounts to above twenty ſhillings a buſhel.

23. Other *ſands* there are alſo of very good uſe, to give a conſiſtency and body to *glaſs*; the naturally whiteſt are at *Nettle-bed* and *Shot-over*, but the fineſt by much at *Finſtock* and *Ledwell*, which when waſhed and cleanſed, at leaſt equal the former. The firſt of theſe has been tryed with ſucceſs at the Glaſs-houſe at *Henly*: and any of the reſt, perhaps, might prove as good *Tarſo* as any they have from *France*, or is uſed in *Italy*, were they but in place where they might be tryed.

24. From *Sands*, I proceed to *Lapis arenarius*, commonly called *Free-ſtone*, and uſed in Building; of which we have as great plenty and variety in *Oxford-ſhire*, peradventure as in any other part of *England*. The Quarry at *Heddington*, ſcarce two miles from *Oxford*, ſupplies us continually with a good ſort of *ſtone*, and fit for all uſes but that of *fire*; in which, that of *Teynton* and *Hornton* excel it. In the Quarry it cuts very ſoft and eaſie, and is worked accordingly for all ſorts of Building; very porous, and fit to imbibe lime and ſand, but hardening continually as it lies to the *weather*.

25. Of it in general, there are two ſorts; one that they call *Free-ſtone*, and the other *Rag-ſtone*: but theſe again are ſubdivided into ſeveral *ſpecies*, according as they are cut or put to divers uſes. The *Free-ſtone*, if cut *cubically* into very great blocks, is then by way of eminence called nothing but *Free-ſtone*; but if cut into *oblong*, or other ſorts of *ſquares*, of a leſſer bulk, they then call it *Aſhler*; and the fragments of theſe of inequilateral, multangular Figures, *Scabble-burs*. The two firſt are uſed in principal Buildings, and the laſt, if ſquared, is ſomtimes mixed with *Aſhler* in *Range-work*, or by it ſelf in that they call *Planten-work* in the meaner Buildings: but when not ſquared at all, is commonly thrown in amongſt *Rag-ſtone* for walling; for which only, and making *lime*, that ſecond ſort is good, except it riſes flat in the bed, and then 'tis worth the while to hew it for paving.

26. Of the *ſtone* afore-mentioned conſiſts the groſs of our Buildings; but for *Columns*, *Capitels*, *Baſes*, *Window-lights*, *Door-caſes*, *Corniſhing*, *Mouldings*, *&c.* in the chiefeſt work they uſe *Burford-ſtone*, which is whiter and harder, and carries by much a finer *Arris*, than that at *Heddington*: but yet is not ſo hard as

that at *Teynton*, nor will it like that endure the fire, of which they make *Mault-kills*, and *hearths* for *Ovens*; but then they take care to *ſurbed* the ſtone, *i. e.* ſet it edg-ways, contrary to the poſture it had in the bed, for otherwiſe there will be ſome danger of its flying.

27. Beſide the fire, it endures the weather, for of this mixed with another ſort dug near *Whately*, on the *Worceſter* road ſide, as it paſſes betwixt *Holton* and Sir *Timothy Tyrrills*, are all the oldeſt *Colleges* in *Oxford* built; as *Baliol*, *Merton*, *Exeter*, *Queens*, *Canterbury* (now part of *Ch. Ch.*) *College*, *Durham* (now *Trinity*) *College*, *New College*, *Lincoln*, *All Souls*, *Magdalen*, *Braſen-noſe*, and the outermoſt Quadrangle of *St. John Bapt. Coll.* yet it endures not the *weather* ſo well as *Heddington*, by reaſon, I ſuppoſe, of a ſalt it has in it, which the weather in time plainly diſſolves, as may be ſeen by the Pinnacles of *New College* Chappel, made of this ſtone, and thus melted away.

28. And yet the moiſture of water has no ſuch power over it, but that they make of it *Troughs* and *Ciſterns*, and now of late *Meſh-fats* for *Brewing*; firſt hinted, 'tis true, by Mr. *Bayly* of *Ducklington*, but practiſed by one Mr. *Veyſey* of *Teynton*, who had the firſt made him by one *Strong* a Maſon, which it ſeems did anſwer expectation ſo well, that it has ſince obtained in many other places. Of theſe, that generous and courteous Gentleman, Sir *Compton Read* of *Shipton* under *Whichwood*, has one that holds about ſixty five buſhels, drawn home with no leſs than one and twenty horſes; they ordinarily *meſh* in it three quarters of Mault, but can, when at any time neceſſity requires, *meſh* five at a time: the dimenſions of which Veſſel of one ſingle ſtone, taken within the hollow and abating its thickneſs, becauſe of its vaſt unuſual magnitude, I thought fit to note, and give as followeth;

long, 2 yards $\frac{1}{8}$.
broad, 1 yard $\frac{1}{8}$. and $\frac{1}{2}$ an inch.
deep, 1 yard $\frac{1}{2}$.

yet much larger than this might be had from the Quarry, were there uſe for them, or could portage be contrived; for as I was informed by many credible witneſſes, there was one ſingle ſtone dug in this Quarry, containing no leſs than *three hundred tuns*. And another in the year 1673. meaſured by Mr. *Veyſey*, of an *hundred*

hundred and three tuns, accounting ſixteen foot cubic to the *tun*.

29. Other Quarries there are alſo of conſiderable uſe, as *Bladen*, *Little Milton*, *Barford*, and *Hornton*, whereof the laſt has the beſt Fire-ſtone of any in the *County*; ſome of it ſeems to have Iron-colour'd veins, that receive (as I have ſeen) a tolerable poliſh, and is the *ſtone* I mention'd before, whoſe *chippings* (laid on it) improve their land, by reaſon I ſuppoſe of the *ſalt* there is in it, which may alſo be the cauſe it endures *fire* ſo well.

30. At *Cornbury Park* there was a ſort of *ſtone*, the Quarry whereof is now quite exhauſted, that never would ſweat in the moiſteſt *weather*, of which the pavement of the *Hall* in the houſe there, ſtill remains as a ſufficient teſtimony: of this, did it riſe in great blocks, might poſſibly have been made very good *Mill-ſtones*, the not ſweating being a principal qualification in all *ſtones* whatever uſed for *Corn-mills*.

31. But before we take leave of materials for Building, we muſt not forget that the Houſes are covered, for the moſt part in *Oxford-ſhire* (not with tiles) but *flat-ſtone*, whereof the lighteſt, and that which imbibes the water leaſt, is accounted the beſt. And ſuch is that which they have at *Stunsfield*, where it is dug firſt in thick cakes, about *Michaelmaſs* time, or before, to lye all the *winter* and receive the froſts, which make it cleave in the *ſpring* following into thinner *plates*, which otherwiſe it would not do ſo kindly. But at *Bradwell* (near the Grove) they dig a ſort of *flat-ſtone*, naturally ſuch, without the help of *winter*, and ſo ſtrangely great, that ſomtimes they have them of ſeven foot long, and five foot over: with theſe they commonly make mounds for their Cloſes, and I have ſeen a ſmall *hovel*, that for its whole covering has required no more than one of theſe *ſtones*: and ſome of them are of ſo hard and cloſe a *texture*, that I have known them by *Painters* of very good ſkill, preferr'd before *Marble* for grinding their *colours*.

32. To *ſtone* uſed in Building they ſomtimes add *Lime*, which becauſe for the moſt part, is here made of *ſtone*, muſt alſo be handled in this place; for which they count the hardeſt *rag-ſtone* beſt, but any will make it, ſays the Learned *Willis*[d], except ſuch

[d] *De Ferment. cap.* 10.

as is made up of a reddiſh kind of gravel: the beſt ſign of it here, as well as in *Ireland*, has been ſufficiently hinted in the former Chapter, to be that *white* and *ſpungy* kind of *matter*, that ſticks to the *ſtones* in the caverns of the Rocks, and ſo plentifully found at *Cornwell* and *Whately*; at *Hanborough*, *Fawler*, and in *Cornbury* Park. Not but that very good *Lime* may be had from ſtone that ſhews not the leaſt of this ſign, as at *Bladen* Quarry, and many other places, but that none makes better then the ſtone that has it; except hereafter it may be found true here, what *Lachmund* [e] aſſerts of the *Biſhoprick of Hildeſheim*, where the beſt (he ſays) is made of the hardeſt ſtone, *quod varia in ſe Conchylia continet*, ſet full of *petrified* ſhell-fiſh: for if ſo, our beſt *Lime-ſtone* muſt be at *Charleton* and *Langley*; at *Little Milton*, and *Shot-over Forreſt*, in the Quarry there on the north ſide of the Hill, not far from the way to Sir *Timothy Tyrrills*; at all which places, the ſtone is ſtuck full of *Cockles*, *Eſcallops*, and *Oyſters*, of which more anon in the following Chapter.

33. Beſide the ſtone that is uſed for the *ſubſtance*, there is other that ſerves for the *ornament* of Building, a ſort of *gray Marble* dug in the Pariſh of *Blechington*, in the Lordſhip of the Right Honorable *Arthur* Earl of *Angleſey*, Lord *Privy Seal*: Of this there are ſeveral *Chimny-pieces* and *Pavements*, in his *Lordſhips* Houſe there, well worth the notice; as alſo at the Right Honorable the Earl of *Clarendon*'s at *Cornbury*. And of this are the Pillars of the *Portico*'s at St. *Johns College* in *Oxford*. They make beſide of it *Tomb-ſtones* and *Tables*, and of late alſo *Mill-ſtones*, good enough for the *Oyl-mills*; but not for the *Corn-mills*, becauſe of its ſuppoſed ſweating, to which this is ſubject in rainy weather, like all other *Marbles*.

34. Some other *ſtones* there are of inferior uſe, which yet muſt by no means be paſt by in ſilence; whereof I know one ſo like the *Tripoli-ſtone*, in colour, conſiſtence, and for all its uſes, that I cannot but think it of the very ſame kind: to *ſilver* it gave that very laſting brightneſs, that another piece of Plate that was tryed againſt it, receiv'd from the Gold-ſmiths *Tripoli-ſtone*, and proved it ſelf in all reſpects ſo much the very ſame; that would any thing pleaſe us not far fetch'd, perhaps there might be no further need of ſending any more to *Africa* for it.

[e] *Lach.* Ὀρυκτογραφία, *Sect.* 3. *cap.* 1.

35. Nor

35. Nor must I forget the *Iron-stone* at *Shot-over*, though occasionally mention'd, and its uses delared, in the immediatly preceding *Chapter of Earths*: so called, not from any such metal that it holds, but meerly I suppose from the colour 'tis off. This I tryed with the *Load-stone* and *Aqua fortis*, thinking thereby, if it held any *Iron*, it must needs have confest it to one of those two. But I since have found the *Experiments* but ill applyed, for neither will *Cavala* (which is the best *Iron-ore*) answer either of them: So that I do not now condemn it to be no *Iron-ore*, upon those grounds as at first, but from other considerable differences it has from the known *Iron-ores* of *Glocester-shire* and *Sussex*.

36. There is also near *Thame* on *Cuttlebrook-side*, another *Iron-colour'd stone*, but more spungy than the former, and including within it a blackish kind of *Cinder*; the most like, of any thing I yet have seen, to *Magnesia* (in the Glass-houses, called *Manganese*) only it wants of its closeness of texture and weight: what it should be, or for what use likely, to me I confess is wholly unknown, unless I may call it the *Siderites* of *Pliny*[f]. I therefore desist to say more about it, but commend it to the discovery of future ages.

37. At *Eyfield-merrymouth*, in the Field above the *Cave* lately made by Mr. *Bray*, in the bank near the Brook, I found a *stone* of a light yellow colour, made up of glittering *Lamellæ*, or Plates, which according to the description of *Georgius Agricola*[g], seems not unlike the *Samian-stone*, found also about *Hasda* in the Bishoprick of *Hildesheime*, and good only for polishing *silver* and *gold*. Such laminated Stones by *Nicolas Steno*[h] are thought to be nothing but *incrustations*, made in the confines of a *fluid* and *solid*, an opinion that seems to come near to the truth. However it be, it is somthing *formed*, and may well serve to usher in the next Chapter, which I have wholly reserved for *formed stones*.

[f] *Hist. Nat. lib.* 37. *c.* 10. [g] *Fossilium, lib.* 5. [h] *In Prodromo.*

CHAP.

CHAP. V.

Of Formed Stones.

AFter *Stones* made to ſerve the *neceſſities* of Man, and not brought into *form* but by the tool of the *Artiſt*, come we next to conſider thoſe that are *naturally formed*, and ſeem rather to be made for his *admiration* than *uſe*. Whereof the World is beautified with ſo great variety, that as on the one hand I cannot but wonder at the great Providence of *God*, and his moſt perfect Workmanſhip, that has thus created the *Univerſe* for Mans *delight* as well as *uſe*: ſo on the other, I cannot but reprehend the petulant deſpiſers of this innocent ſort of Learning, who in deriſion have called it, *picking of ſtones*; as if what the Omnipotent and moſt wiſe *God* hath thought fit to *create*, were not worth the conſideration of weak *Man*. But let ſuch malicious Scoffers know, that 'tis their pride and ignorance that has engaged them in this Cenſure: for as God has created them, ſo ſome things muſt be written off meerly for information, as well as others that tend to our advantage. Beſide, who knows but theſe things may have a uſe, that hereafter may be diſcover'd, though not known at preſent. Since then their Exceptions are ſo ill grounded, that they vaniſh in a manner as ſoon as named, 'tis but juſt that I pay them in their own coyn, and ſlight their judgment more than they dare do my *ſubject*.

2. In the handling whereof, though in a particular *Chapter*, I ſhall obſerve the method of the whole *Eſſay*: And firſt treat of ſuch *formed ſtones* as either in name, or thing, or both, relate to the *Heavenly Bodies* or *Air*; and next, ſuch as belong to the *Watery Kingdom*: After them, ſuch as reſemble *Plants* and *Animals*, whether in the whole, or parts. And laſtly ſuch *ſtones*, wherein contrary to all rule, *Dame Nature* ſeems to imitate *Art*; for ſo far from idleneſs (ſays a very good Author [i]) is Nature in the bowels and dark caverns of the earth, that ſhe continually plays the *Geometrician* there, and preſents us with Bodies, almoſt of all kinds, in *ſtone*.

[i] *Encelius, de re Metallica, cap.* 7.

3. Amongſt

3. Amongſt the *ſtones* that have relation to the *Heavenly Bodies*, the firſt place I think may be reaſonably given to ſuch as reſpect the *greater Lights*; upon which account, ſince the *Heliotrope* is not found here, much leſs the *Gemma Solis*, mentioned by *Pliny* [k]: The *Selenites* or *Moon-ſtone* muſt have the precedence, which we find in great plenty in a bluiſh clay that lies above the Rock at *Heddington* Quarry, and in digging Wells, *&c.* at *Hampton-Gay* and *Hanborough*.

4. Where by the way let it be noted, that I intend not by the *Moon-ſtone*, the grey *Tephrites* of *Pliny* [l], that grows like a *Creſcent*, by the *Greeks* called *Menöis*; nor that other ſtrange ſtone mention'd by *Pliny* and the Poet *Marbodeus* [m], corporeally containing the Figure of the *Moon* increaſing and decreaſing, like that in the *heavens*: but a ſtone ſo called, not from its figure, but (as 'tis honeſtly confeſt by *Geſner* [n] and *Agricola* [o]) that only repreſents the Image of the *Moon*, in all its *phaſes*, but beſt at full, juſt as it were in a glaſs, and therefore by Authors is ſomtimes called alſo *Lapis ſpecularis*.

5. And thus much will our *Selenites* do, if obverted to the raies of the *Moon* in right angles; which if all that is really intended by the name, (for the very ſame reaſon) I know not why it may not as well be called the *Sun-ſtone* too, ſince it equally repreſents the one as well as the other.

6. But though it hath nothing of the *Moon* in figure, yet it is commonly found of a certain ſhape, in circuit *hexangular*, but with two of the ſides broader and more depreſſed, in the form of a *Rhomboides*, as in *Tab.* 2. *Fig.* 1. *a.* and therefore the learned *Steno* [p] (which I think its beſt name) not unfitly ſtiled it *Selenites Rhomboides*. Beſides the two larger *Rhomboideal* ſides, it hath eight others of an oblong ſquare, in all making up a *decahedrum parallelipipedum*; whereof the ſquares of the two ſhorter ſides of the great *Rhomboides*, one is ſomtimes a *right angled inequilateral parallelogram*, as in *Tab.* 2. *Fig.* 1. and the other a *Rhomboid*; and ſomtimes again they are both *Rhomboids*, but thoſe on the longeſt ſides of the great *Rhomboids*, as far as I have obſerved, are always *Trapeziums*.

7. As to its texture, the grain runs ſeveral ways, but ſlits the

[k] *Nat. Hiſt. lib.* 37. *cap.* 10. [l] *Nat. Hiſt. loco citato.* [m] *Muſæum Calceolarium, ſect.* 3. [n] *De figuris lapidum, cap* 2. [o] *De Natura Foſſilium, lib.* 5. [p] *In Prodromo, pag.* 74.

eaſieſt of any of them, in a *planum* to the more depreſſed *Rhomboideal* ſides; which way it may be cut into very thin plates by *Aldrovandus*[q], called *Scaias*, for which reaſon 'tis called alſo *Alumen Scaiolæ*; not that it has the taſt of *Alum*, or any thing like it. It breaks alſo another way into ſmall *threds*, of which it ſeems chiefly to be compoſed, much after the manner of *Amiantus* or *Talc*, but its parts not ſo pliant as either of them: theſe *threds* lie for the moſt part, cloſe and paralel to the longer ſides of the great *Rhomboids*, as they are deſcrib'd in *Tab.* 2. though I have ſeen them ſomtimes alſo parallel to the ſhorter; but they ſeem not to be continued the whole bredth of the *Rhomboid*, but divided by other parallel lines of a greater diſtance, that ſomtimes are ſubtended to the *acute* angles of the *Rhomboid*, but moſt commonly run in a more oblique poſture, as may likewiſe be ſeen in *Fig.* 1. *a*. In theſe lines its parts are alſo eaſily ſeparated, but breaking ſhort off, and nothing ſo flexible as they are when broken as the threds run. According to ſome peculiar poſitions of theſe parts, there are ſome of them that really repreſent the *Rain-bow*; whereof I have ſome with the colours as vivid, as I ever ſaw any in a glaſs *Priſm*. Of theſe *Aldrovandus* had one out of *Cyprus*, of which he has given us a Cut in his *Muſæum*[r]; but it being in Mans power to make theſe *Rain-bows* as he pleaſes, I think even thoſe we find thus, to belong of the two rather to caſualty than nature, and therefore paſs them by.

8. There is, 'tis true, a ſort of them of a different figure, not ſo eaſily to be met with, with only two depreſſed ſides, and ſcarce any *angles*, but what are ſo *obtuſe* that they deſerve not the name, in the whole almoſt of an *Oval form*, as repreſented *Tab.* 2. *Fig.* 1 *b*. This ſort of *Selenites*, beſides the ſhape, is alſo ſo different from the former in texture, that it ſlits not like that into plates or ſcales, parallel to the moſt depreſſed ſides, but quite contrary parallel to the thickneſs only; which I take to be a *character* abundantly ſufficient, to make it of a different *ſpecies* from the other, though in the reſt of their texture they be much the ſame.

9. About the origin of this matter, Authors differ much; amongſt whom *Galen*[s] makes it the dew of Heaven, congeled, as he ſays, by the light of the Moon, and therefore calls it by the name of *Aphroſelinum*, but reſtrains the performance of the feat

q *Muſæum Metallicum, lib.* 4 *cap.* 33. r *Lib.* 4. *cap.* 33. s *Lib de Simp. Med. ad Patern.*

to

to *Egypt*. *Encelius*[t] thinks it a ſort of moiſture of the earth, ſo concreted, that like *Chryſtal* it will not diſſolve, but remains as it were an indiſſoluble *Ice*, whence the *Germans* took occaſion to call it *Glacies Mariæ*. But that learned and induſtrious inveſtigator of Nature, *Georgius Agricola*, differs from them all, and makes it a product of *Lime-ſtone* and *water*, *Gignitur* (ſays he) *ex ſaxo calcis cum pauca aquâ permiſto*[u]; and thus I find it to grow here with us at *Heddington*, in a blue clay that lies over the Quarry, whoſe outermoſt cruſt is a hard *Lime-ſtone*.

10. The learned and ingenious *Steno*[w] in his *Prodromus*, thinks *Chryſtalls* and *Selenites*'s, and all other Bodies having a ſmooth ſurface to have been already hardened, when the matter of the Earth, or ſtones containing them, was yet a *fluid*; if ſo, indeed *Agricola* muſt be out in his aim. But I cannot ſee how our bed of clay at *Heddington*, above the Quarry at ſome places ten foot thick, could have been a *fluid* within ſome ages paſt; and yet of the *Selenites*'s of the *Rhomboideal* Figure, I find ſome as ſmall as a Barley-corn, ſome about three inches, and others again at leaſt half a foot long: ſo that they ſeem rather to have ſome ſucceſſion of growth, and now to be in *fieri*; than to have been all together already hardened, when the clay that now contains them was but a *fluid*. Beſide, they then would have been found cloſe together, whereas we here meet them ſome higher ſome lower, and mix'd all together little and great; and the very clay it ſelf, as 'tis broken to pieces, ſeeming ſomwhat inclinable to this ſort of form.

11. A third ſort we have of them alſo found here at *Heddington*, in the very ſame clay, as alſo at *Cornwell* and *Hanwell*; with two ſides like the former, more depreſſed then the other, in compaſs alſo *hexangular* (the thineſt ſides of them being divided by a ridge) but in the form, not of a *Rhomboid*, but an *inequilateral parallelogram*, as in *Tab.* 2. *Fig.* 1. *d**. Some of theſe we find ſingle, lying in any poſture, the biggeſt ſcarce an inch broad, or above four inches long; and others joined together in a certain poſition, with their flatteſt ſides towards each other, and edges downward, and their ends conſtantly meeting in a *center*. The Ingenious Sir *Thomas Pennyſton* has obſerved, that at *Cornwell* they generally lye in *ternaries*, but here at *Heddington* we find them

t *De Lapidibus & Gemmis, lib.* 3. *cap.* 56. u *De Natura Foſſilium, lib.* 5. w *Prodromi prop.* 1. *obſervat.* 1. * There are ſuch as theſe in *Spain*, *Thuringia*, and *Cappadocia*. *Aldrovand. lib.* 4. *cap.* 33.

oftentimes more, and not unfrequently *irradiating* all manner of ways into the form of a *Globe*, the ſeveral *Selenites*, like ſo many *radii*, all pointing to the *center*, as is plainly repreſented by one half of ſuch a *globe* of them, in *Tab.* 2. *Fig.* 1. *c.*

12. The texture of theſe is ſomthing agreeable, and ſomthing different from the *Rhomboideal Selenites*, for they all cleave in a *planum* to the flatteſt ſides, and ſeem to conſiſt of ſmall *threds* like them; but ſome have the *threds* running obliquely to the whole ſquare, as in the lower part of *Fig.* 1. *d.* others have them meeting in the middle of the flat in an *obtuſe* angle, as in the upper part of the ſame *Figure.*

13. The meeting of which *threds* ſo in an *obtuſe* angle, I thought at firſt might have very well occaſioned that repreſentation of the *gramen ſegetum paniculâ ſparſa*, *fair panicled corn* or *bent-graſs*, to be ſeen in moſt, if not all of this kind (which like a *fly* or *ſpider* in *amber*) ſeem to be included at each end of them, with the *panicles* turned contrary to each other: But I quickly found my ſelf miſtaken, by ſlitting of ſeveral, whereby I diſcovered, that the *threds* ſomtimes ran quite contrary to the ſpreading *panicles* of the *corn* or *bent-graſs* (ſo very well counterfeited in many of them) and therefore not likely to give that form: And that the thing it ſelf was nothing but clay, thus pretily diſperſed in the form of a *bent*; which beſide the pleaſure of the ſurprizal, gave me another argument againſt *Steno*'s opinion, *That* Selenites'*s were all hardened, when their beds they now lie in were nothing but* fluids: for it cannot well be conceived how the clay ſhould any way get to be within them, had it not had a being before the *ſelenites*, and thus included at the time of their formation.

14. Of *formed ſtones*, though there are few that have any, yet ſome there are of eminent uſe, and ſuch is our *ſelenites* or *ſpecular ſtone*; good taken inwardly for many diſtempers, number'd up by *Cerutus*[y], *Aldrovandus*[z] and *Galen*[a]; and externally to take away the *blemiſhes of the face.* In ancient times, before the invention of *glaſs*, it was of very great uſe for *Lanterns* and *Windows*, it being eaſily ſlit into very thin plates, yet looſing nothing thereby of its *diaphaneity.* Of this ſays *Agricola*[b], are the

[y] *In Muſæo Calceolario, ſect.* 3. [z] *Lib.* 4. *cap.* 33. *Muſ. Metal.* [a] *De Simp. Med. facult. lib.* 9. [b] *De Natura Foſſilium. lib.* 5.

Church-

Church-windows made at *Caſwick* in *Saxony*, and *Merſeburg* in *Thuringia*, which certainly muſt be of a different ſort, from what is deſcribed by *Aldrovandus* [c] and *Wormius* [d]: the one whereof ſays 'tis *imbrium impatiens*; and the other, *humido corruptibilis*. I expoſed this of ours many rainy days, but could not find that from the weather it received any damage, and therefore gueſs it to be the ſame deſcrib'd by *Agricola*: I ſteeped it likewiſe many days in water, but found not any ſenſible alteration of its body, though it gave the water both an odd ſmell and taſt. As for *Lanterns* and *Windows*; ſo they anciently uſed it in making of *Bee-hives*, that through it they might ſee the *Bees* operations, as in *glaſs-hives* now: an Invention by ſome people taken for new, though very well known in the days of *Pliny* [e].

15. Out of burnt *ſelenites* is made the beſt *gypſum*, for *Plaiſtering*, *Images*, *Fret-works*, *&c.* When burn'd, it turns to a pure white *Calx*, by the *Italians* called *Geſſo*, from the Latin word *gypſum:* Of this they make thoſe curious counterfeit *Tables*, like Marble in-laid with divers *Pretious ſtones*, in the forms of *Animals*, *Plants*, *&c.* The way of making them is taught us by *Kircher* [f]; but there is a friend of mine has a better *method*, who intends very ſpeedily to make ſome attempt to make them in *England*, and of *Engliſh* materials. And ſo much for our firſt *formed ſtone Selenites*, on which I had not dwelt ſo long, but to ſupply the defects of other Authors, whoſe deſcriptions of it are but mean and imperfect.

16. After the *Moon-ſtone*, the *Aſteriæ*, or *Star-ſtones*, next offer themſelves to our conſideration, which, to avoid the confuſion of other Authors, I ſhall only call thoſe, whoſe whole Bodies make the form of a Star, as in *Tab. 2. Fig.* 2,3, in oppoſition to the *Aſtroites*, which in the whole are irregular, but adorned as it were with a *Conſtellation*, as in *Fig.* 4, 5, 6 and 7.

17. The *Aſteria*, or *ſtar-ſtone*, otherwiſe by *Geſner* [g] called *Sphragis Aſteros*, or *ſigillum ſtellæ*, becauſe of the uſe it is ſometimes put to, is plentifully found in the Fields at *Cleydon*, the moſt Northern Pariſh of the whole County, Northward from the Church, and particularly on the Furlong called *Hore-ſtone* Furlong: the texture of as many as I have yet ſeen, ſeems to be

c *Muſ. Metal. lib.* 4. *c.* 33. d *In Muſæo, cap* 7. e *Nat. Hiſt. lib.* 21. *cap.* 14. f *Kircheri Mundus ſub terr. Lib.* 12. *ſect.* 5. *part.* 3. *cap.* 3. g *De Figuris Lapidum, cap.* 2.

of

of thin *lamellæ* or plates, lying obliquely to the *Horizontal* position of the *Star*, much after the manner of *Lapis Judaicus*, and their colour various, according to the different Soils they are found in: whence 'tis, that in *Glocester-ſhire* and *York-ſhire*, where they are taken out of a blew clay, they are almoſt themſelves of the ſame colour, breaking, as the Ingenious Mr. *Liſter* informs us[h], *Flint-like*, and of a dark ſhining politure. In *Warwick-ſhire* they are accordingly, and in ſome places alſo of *Glocester-ſhire*, of a cinereous colour. And here at *Cleydon*, becauſe taken forth of a yellowiſh earth, of a yellow colour, herein varying from all I had ſeen before. They differ much alſo from thoſe of other *Counties* in circumference and ſoftneſs; for here we have them ordinarily of above an inch and half, and ſcarce any ſo little as an inch in compaſs; than which in thoſe *Counties* there are but few bigger. And whereas in other Counties they are ſo hard and ſo firmly cemented, that 'tis very difficult, if at all poſſible, to ſeparate them from each other, without ſpoiling the *Intagli* or workmanſhip of the Stars; theſe if but ſteeped a night in *vinegar*, or other ſharp liquor, may be divided the next morning with ſafety and eaſe.

18. And as in colour, circumference, and hardneſs; ſo theſe ſometimes differ from thoſe of other places in *figure* too, as *Tab.* 2. *Fig.* 2. where beſide the ſculpture that makes up the angles, there is plainly repreſented a *roſe*, or other *uniform* figure, in the middle of it, which I never ſaw at any other place, nor indeed are ſuch often to be met with there.

19. In all other matters, I think theſe *Aſteriæ* of *Cleydon* agree with the accurate deſcription of them, by the Ingenious Mr. *Liſter*[i]; all ſeeming to be fragments, and no intire Bodies, and found either in one ſingle joint, as in *Tab.* 2. *Fig.* 2. or in 2, 3, 4, 6, 8, 10, or 15 heaped together, as in *Fig.* 3. making a *pentagonous cylindrical column*, of which I met with none that were full an inch long; but however, gueſs that about 20 *joynts*, as in other places, may go to an inch: every *joynt* conſiſts of *five angles*, which in ſome are very *obtuſe*, in others more *acute*; the middle of each *angle* is a little hollowed, and the edges more prominent and thick furrowed, by which the ſeveral *joynts* are knit together, their ridges and furrows being alternately let into

[h] *Philoſoph. Tranſact. Numb.* 112. [i] *Ibid.*

one

one another. In the *center* of the *five angles* is a ſmall hole, conſpicuous enough in moſt of them; but in ſome I have obſerved the ſmall hole on one ſide, and a little prominency on the other, fit as it were to be let in to the *Central-hole* of the next *joynt*, after the manner of the ridges and furrows of the *angles*.

20. Many of theſe longeſt jointed *Aſteriæ*, have certain *joynts* a thought broader and more prominent than others, dividing the whole body as it were into certain *conjugations*, of two, three, or more *joynts*; which *conjugations*, ſays the learned and curious Obſerver, Mr. *Liſter* [k], are marked (as he calls them) with ſets of *Wyers*, which though I could not perceive in any found at *Cleydon*, yet when I put a *column* of them into *Vinegar*, at thoſe very places I could perceive *bubbles*, ſtanding as it were at the *orifices*, where formerly theſe *Wyers* were in all likelyhood inſerted, by no means otherwiſe viſible to the eye. And whereas 'tis certain that moſt of theſe in other *Counties*, if of any conſiderable length, are not ſtraight, but viſibly bent and inclining; theſe are not now, or ſcarce appear to have ever been ſo, though poſſibly this may rather be referred to the ſhortneſs of thoſe I met with, or ill luck in finding none of the kind, than to any different operation in nature here, from her uſual performances in other places.

21. They are found alſo about *Swerford* of the ſame colour, but nothing ſo plentifully, or large as theſe at *Cleydon*, for the biggeſt I found there was ſcarce an inch round; in all other reſpects they correſpond with them, only the *conjugations*, made by the prominence of ſome *joynts* beyond the reſt, are more viſible in theſe than in any at *Cleydon*.

22. Of *Aſtroites* or *ſtarry-ſtones*, ſuch as in bulk are *irregular*, but adorned all over with many *ſtars*, there are no leſs in this *County* than four ſeveral ſorts: Whereof, in two, the ſtars are in *mezzo Rilievo*, prominent, and ſtanding outward, with the *ſtriæ* or *ſtreaks* deſcending from the Center at the top, on all ſides to the Rock on which they grow. Some of theſe are of a larger, as *Tab.* 2. *Fig.* 4. and others of a ſmaller kind, as *Tab.* 2. *Fig.* 5. both found in the Quarries of *rubble-ſtone*, dug only for mending the High-ways, not far from the foot of *Shot-over* Hill, on the right hand of the road from *Oxford* to *London*, in the Pariſh of *Heddington*.

[k] *Philoſoph. Tranſact. loco citato.*

23. A *third* ſort there is, and indeed the moſt beautiful of any it has been hitherto my luck to meet with, to be had in the Fields about *Steeple-Barton*, firſt diſcovered to me by a worthy Gentleman, ſince deceaſed, the Worſhipful *Edward Sheldon* Eſq; to whoſe furtherance of my deſign I am not a little indebted. But theſe, quite contrary to the former, are *Intagli*, deeply engraven like a *ſeal*, and ſtriated from the prominent edges above (which for the moſt part are *Hexagons*, and ſomtimes *Pentagons*) to a *center* in the bottom, as in *Tab.* 2. *Fig.* 6. yet agree with the former in this, that the Stars of all three are only ſuperficial, and not to be found in the body of the ſtone, and have none of them (that I know of) been any where noted before.

24. To theſe add a *fourth* ſort, imperfectly deſcribed by *Geſner*, and out of him by ſeveral others; whoſe *ſtriæ*, like the *third* ſort, deſcend in a *concave*, but from edges moſt times *round*, or *quinquangular* at the top, and tend to a *center* not of their own kind, as in *Fig.* 6. but ſmooth; and not depreſſed, but viſibly prominent, as in *Fig.* 7. Theſe are found in the afore-mentioned Quarries of rubble-ſtone in the *Pariſh* of *Heddington*, and are *ſtellated* not only in the *ſuperficies* of the ſtone, but quite through the whole depth of it, yet not ſo that one continued *ſtar* (as ſome have thought) does reach through it; but many, according to the thickneſs of the *ſtone*, about ten of them lying in the depth of an *inch*, much after the manner of the *Aſteriæ* or *Star-ſtones*, only they are not ſeparate, but joined together, and making as it were ſo many *ranges* in the *ſtone*, which are clearly repreſented by *Fig.* 8. which ſhews the face of ſuch a *ſtone*, cut parallel to the deſcent of the *ſtars* in its body, which lie within one another like ſo many *cones*.

25. Of this *ſort* in *France* there are ſome ſo great, as *Geſner*[m] was informed by *Petrus Bellonius*, that they uſed them in building of *Walls* and *Houſes*; to which uſe 'tis true we do not put *ours*, but I ſuppoſe it is not for want of *bigneſs*, but becauſe we have much better ſtone for that purpoſe: for here we have them likewiſe ſo plentifully and great, that we commonly pave our *Cauſeys* with them, as may be ſeen in the *Cauſey* without St. *Clements*, leading from *Oxford* up *Heddington hill*.

26. Having hitherto conſidered theſe *ſtones* apart, and ſeen

[l] *De Figuris Lapidum*, cap. 2. [m] *Ibid.*

how

how they differ from one another, let us now consider them *all* together in that admired quality of their *moving in Vinegar*, which in some measure is found in the *Astroites*, but is much more signal in the *Asteriæ* or *Star-Stones*: for the *Astroites* must be broken in very small pieces before they will move, though put in good *Vinegar*, but the *Asteria* will move not only in a whole *joynt*, but two or three of them knit together, which I have often seen done by the yellow ones of *Cleydon*, though of greater bulk than those of other places; which joined, with some other circumstances anon to be mention'd, has given me ground to suspect, if not conclude, that though it may be true enough what Mr. *Lister* [n] has asserted, as well of all *fossils*, as the *Stones Astroites*, that as many of them as *Vinegar* will corrode as a *Menstruum*, do all move in it; yet none of them reach the effects it has on the *Asteria*, to which therefore I must crave leave to allow somwhat more than either to the *Astroites* or any other *fossils*.

27. For beside the *progressive motion* to be seen in those, the *Asteria* has a motion of *circumgyration*, and moves brisker and longer than any of them; for though it hath been steeped in *Vinegar* three or four days, yet upon infusion of a fresh *acid*, it still sends forth many little *bubbles* as at first, from underneath it, in the instant of its motion: which seems to argue, that it has it not wholly from the corrosion of the *Menstruum*, but in part at least from some other principle, which I take to be a *spirituous*, yet *corporeal effluvium*, continually flowing from it, when provoked by an *acid*.

28. Whereof there is *one*, which hereafter shall be publick, found out indeed by chance at the House of Mr. *Wildgose*, *Physitian* at *Denton*, and an ingenious *Chymist*, whose assistances (in gratitude) I must ever own: where not having *Vinegar* so ready at hand, we thought fit to make use of another suitable *liquor*, which so effectually excited the *effluviums* of the stone, that they ascended in a cloud to the surface of the *Menstruum*, and there setled exactly in the form of the *stone*, and that not only of a single *joynt*, but a whole *column* of them together: which perswaded me, that *Cardan* [o] was not so far out of the way, nor deserved so much the reproofs of *Aldrovandus* [p] and others, for asserting the motion of such *stones* to arise, from vapors expelled from

[n] *Philosoph. Transact. Numb.* 100. [o] *Subtilit. Lib.* 5. [p] *Musæum Metallic. lib.* 4. *cap.* 65.

them by the power of the *Vinegar*. Since perhaps his poſition (though not ſo well made out) comes nearer to truth than any his *Animadverters* have brought for it ſince.

29. After the *ſtones* ſome way related to the *Celeſtial Bodies*, I deſcend next to ſuch as (by the *vulgar* at leaſt) are thought to be ſent us from the *inferior Heaven*, to be generated in the *clouds*, and diſcharged thence in the times of *thunder* and *violent ſhowers*: for which very reaſon, and no other that we know of, the ancient *Naturaliſts* coined them ſuitable names, and called ſuch as they were pleaſed to think fell in the *Thunder*, *Brontiæ*; and thoſe that fell in *ſhowers*, by the name of *Ombriæ*: Which though amongſt other Authors has been the only reaſon why theſe have had place next the *ſtellated ſtones*, yet methinks it is due to moſt of them, by a much better pretence, having ſomthing upon them that rather reſembles a *ſtar* of five points, than any thing coming from the *clouds*, or the Fiſh *Echinus*; to the ſhell whereof deprived of its prickles, *Ulyſſes Aldrovandus*[q], and ſome others, have compared them, and therefore called them *Echinites*. However, I think fit rather to retain the old names, though but ill applyed to the nature of the things, than put my ſelf to the trouble of inventing new ones.

30. Of *Brontiæ* therefore, or *Ombriæ* (call them which you will) we have ſeveral ſorts in *Oxford-ſhire*, which yet all agree in this, that they are a ſort of *ſolid irregular Hemiſpheares*; ſome of them *oblong*, and having ſomwhat of an *oval*; others either more elevated, or depreſſed on their *baſes*. All of them divided into *five parts*, moſt times inequal, rarely equal, by five *rays* iſſuant from an *umbilicus* or *center*, deſcending from it down the ſides of the body, and terminating again ſomwhere in the baſe. They are never found in beds together, like ſome other formed ſtones, nor that I have yet heard of (ſays the Ingenious Mr. *Ray*[r]) in great numbers in one place: but in the latter I muſt take leave to inform him, that though I think it in the main to be true, yet that at *Tangley*, *Fulbrook*, and all about *Burford*, they are found in ſuch plenty, that I believe it were eaſie in a little time, to procure a Cart-load of the firſt ſort of them, carefully exhibited in *Tab.* 2. *Fig.* 9, 10.

31. Whoſe innermoſt texture, though it ſeem to be nothing

[q] *Muſæum Metallic. lib.* 4. *cap.* 1. [r] Obſervations Topograph. *&c. p.* 116.

more

more than a courſe rubble-ſtone, yet is thinly caſed over with a fine *laminated* ſubſtance (the *plates* lying obliquely) much like *Lapis Judaicus:* In form they are flat, depreſſed upon the *baſis*; in colour generally yellow, their *rays* made of a double rank of *tranſverſe* lines, with void ſpaces between the ranks, viſible enough on the top of the ſtone *Fig.* 9. but not ſo diſtinguiſhable on the bottom *Fig.* 10. the whole body of the ſtone, as well as the ſpaces included within the *rays*, being elſewhere filled with *Annulets*, much more curiouſly wrought by *Nature*, than by the tool of the *Graver*.

32. The *center* of theſe *rays*, by *Pliny* called *Modiolus*, by *Ariſtotle*, *Umbilicus*[s], is never placed on the top of the ſtone, but always inclining to one ſide, as that at the bottom do's to the other; the *Axis* lying obliquely to the *Horizon* of the ſtone. Which gave occaſion to a Learned Society of *Virtuoſi*, that during the late Uſurpation lived obſcurely at *Tangley*, and had then time to think of ſo mean a ſubject, by conſent to term it the *Polar-ſtone*, having ingeniouſly found out, by clapping two of them together, as ſuppoſe the *Fig.* 9, and 10. that they made up a *Globe*, with *Meridians* deſcending to the *Horizon*, and the *Pole* elevated, very nearly correſponding to the real *elevation* of the *Pole* of the place where the *ſtones* are found.

33. The two next, repreſented *Fig.* 11, 12. like the former, being flat and depreſſed on their *baſes*, having alſo ſome reſemblance of a *ſtar* of 5 points, were therefore thought fit to be placed next. Whereof the 11 indeed is a beautiful ſtone, found ſomwhere in the *Chiltern* about *Aſton Rowant*, whoſe inner ſubſtance, though of *black Flint*, to outward view is of a cinereous colour, and adorned by Nature with ſomwhat more than ordinary. For beſide the *Modiolus*, and the iſſuing *rays* made of double ranks of *points*, with *tranſverſe lines* interceding them, it is alſo ſet with other *points* ſurrounded with double *Annulets*; on each ſide the *ſtone* with a ſingle, and from the terminations of the *rays* with double ranks. The *points* thus ſurrounded, are neither deeply excavated, nor any thing prominent above the *ſuperficies* of the ſtone; but the *rays* as they are but ſhort (not extending above half way to the *rim* of the *ſtone*) ſo they are deeply hollowed down within it, wherein it differs,

[s] *Lib. de Mundo ad Alexandrum.*

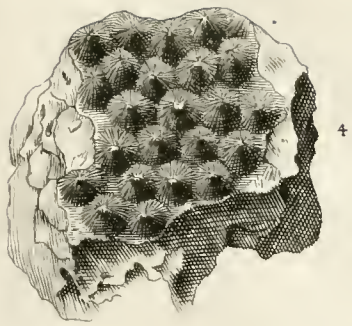
33. From that of *Fig.* 12. found in the Fields about *Iſley*, whoſe *rays* like thoſe of the *Polar ſtones*, are made of double ranks of *tranſverſe lines*, whereof the outermoſt are much the longer, and extended likewiſe to the *rim* of the *ſtone*; its ſubſtance alſo like that ſeems to be a yellow rubble, but not caſed that I can perceive with any ſuch *laminated* ſubſtance, or adorned with *Annulets*, yet the *Umbilicus* of ſome of them, is more beautiful than theirs, it being ſomtimes divided and foliated like a *Roſe*. And ſo much for the *Brontiæ* depreſſed on their *baſes*.

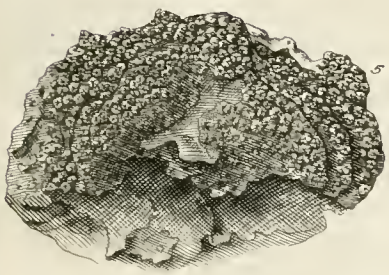
35. Let us now proceed to others of a more elevated kind, whereof thoſe expreſſed *Fig.* 13. found ſomwhere in the *Chiltern*, by the Country people called commonly *Cap-ſtones*, from their likeneſs to a *Cap* laced down the ſides, are of any the moſt uniform. For the *centers* of theſe, both at the top and bottom, are on all hands equidiſtant from the *rim* of the *ſtone*, and the *rays* interceding the *centers* being alſo equidiſtant, cut it exactly into five equal parts; which in none of the former, nor thoſe that are to follow, either by reaſon of their ſhape, or *excentricity* of their *Modioli*, can poſſibly be found. The *rays* of theſe are made of two rows of *points* ſet pretty deep in the body of the ſtone, out of which you are to ſuppoſe, according to *Aldrovandus* (who reſembles this *ſtone* to a diſarmed *Echinus*) proceeded the prickles that *Animal* is fenced with.

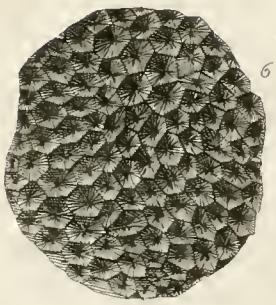
36. As alſo that other ſomwhat of an *oval* form, *Tab.* 2. *Fig.* 14. whoſe *center* correſponds with the figure of the *ſtone*, and is not concluded within the *rays*, as in the former, but is extended in a ridge to the rim of it: from which *center* there deſcend as it were double *rays*, made up of two double ſets of *points*; which, expanding themſelves as they draw toward the *rim*, at about midway are ſurrounded with ſingle *Annulets*, which each of them including two *points* apiece, are therefore all of an *oval* Figure. Its ſubſtance within is a *black Flint*, though without it appear of a *cinereous* colour, and was found in the Fields between *Ewelm* and *Brightwell*.

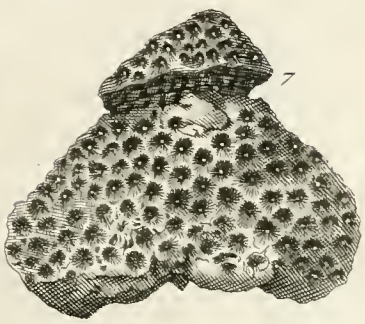
37. At *Pyrton* I met with another of theſe, a *black Flint* within, and *cinereous* without, of *oval* figure and *center* like the former, but the deſcending *rays* from it of a quite different kind: for whereas they were made of *points* hollow and deep, theſe on the contrary are all *prominent*; and whereas they deſcended

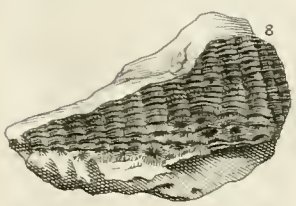
ad pag. 02.

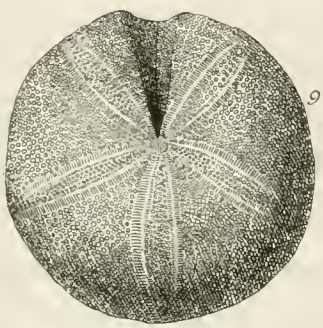


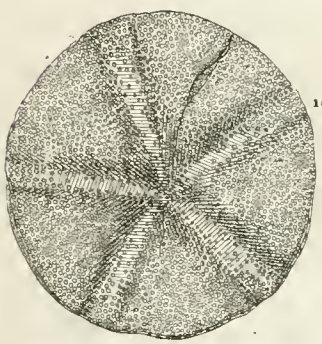


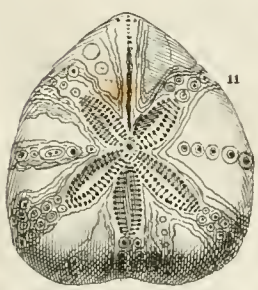


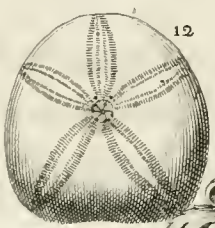


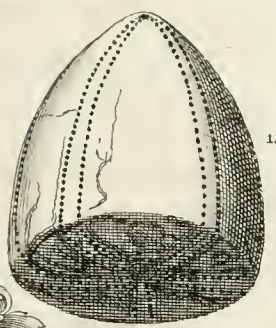


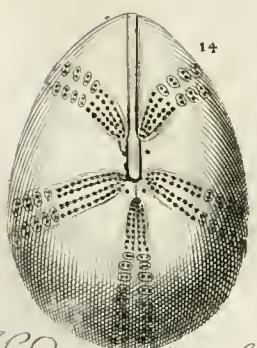












To the right Worsp.ll
The learned and airious
Artist Sr JOHN COPE Baron.t
This second Table
of formed STONES whereof ỹ 9th
& 10th are found in his own grounds.
is humbly dedicated by
R. P. L. L. D.

M Burghers. delin. et sculp.

ſcended in double *branches* and *points*, which near the *rim* were included in *oval Annulets*; the double and *protuberant points* of theſe, about mid-way to the *rim* are turned into ſingle, though much larger ones, as in *Tab.* 3. *Fig.* 1. which now deſcending in ſingle *points*, and meeting in an *Umbilicus* not in the middle of the *baſis*, but ſo much to one ſide, that the branches upon this account being ſome longer ſome ſhorter, and croſſing the *baſis* in a much different manner, make a figure ſomwhat reſembling a *Flower-de-lis*, as in *Tab.* 3. *Fig.* 2. which had been all I ſhould have ſaid concerning theſe *Brontiæ*, but that perhaps it may not be unworthy our notice.

1. That the *protuberancies* of this laſt *ſtone* are all hollow, which when broken, look juſt like the hollow *points* of the former; which has given me ſome ground to ſuſpect, that the deep *points* of that may have formerly been *eminencies* like the raiſed *points* of this, and are only broken down by the injuries of time.
2. That none of theſe *Brontiæ* have been deſcribed before, but the 12 and 13 of *Tab.* 2. which indeed are ſomwhat like the 8 and 10 of *Aldrovandus*[t]: and
3. That though ſome Authors have thought them the petrified ſhells of the *Echinus Spatagus*, or *Briſſus* of *Ariſtotle*, I have reaſon to think (as ſhall appear in a fitter place) that they will prove nothing leſs.

38. Beſide the *Brontiæ* of the Forreign *Naturaliſts*, we have others, which here in *England* we call likewiſe *Thunder-bolts*, in the form of *arrows heads*, and thought by the vulgar to be indeed the darts of *Heaven*: which only in conformity to my own Country (though for as much reaſon as the foregoing *Brontiæ*) I have placed amongſt the *ſtones* related to the *Heavens*.

39. From their form, by all *Naturaliſts* they are called *Belemnites*, from the *Greek* word Βέλεμνον *telum*, which indeed there are ſome of them repreſent pretty well. We have of them in *Oxford-ſhire* of divers ſorts, yet all of them I find agreeing in this, that their *texture* is of ſmall *ſtriæ*, or threds radiating from the *center*, or rather *axis* of the Stone, to the outermoſt *ſuperficies*; and that burn'd, or rub'd againſt one another, or

[t] *Lib.* 4. *cap.* 1. *p.* 455.

ſcraped

ſcraped with a knife, they yield an odour like raſped Horn.

40. In magnitude and colour they differ much, the biggeſt I have met with yet, being that expreſt in *Tab.* 3. *Fig.* 3. in *length* ſomwhat above four inches, and in *thickneſs* much about an *inch* and $\frac{1}{4}$. This was found in the Quarries in the Pariſh of *Heddington*, hollow at the top about an inch deep, and filled with a kind of gravelly earth; and has the *rima* or *chink*, which *Aldrovandus* and *Boetius* ſay all of them have; but I find it otherwiſe, as ſhall be ſhewn anon. Of colour it is *cinereous*, inclining to *yellow*, and if vehemently rubb'd, is the only one amongſt all that I have, that like *Amber* takes up *ſtraws*, and ſome other light bodies.

41. There are of them alſo of a *bluiſh* colour, found at *Great Rolwright* in a *bluiſh* clay, of about a fingers length, hollow at the top, and have ſome of them, inſtead of one, three *clefts* or *rimæ*, but neither ſo plain or long as the former, they aſcending from the *cuſpis* ſcarce half up the ſtone: two whereof are ſhewn *Fig.* 4. and the third hidden behind the *Sculpture*; which may make ſome amends for that of *Fig.* 5. which is of colour *cinereous* and hollow at the top, but has no *chink* at all; whereof there was a bed found in digging the *Sulphur* Well at Mr. *Lanes* of *Deddington*, as was mentioned before in the *Chapter of Waters.*

42. To which add a *fourth* ſort, found in great plenty in the Gravel-pits without St. *Clements*, in the *ſuburbs* of *Oxford*, very few of them hollow at the top like the former, but radiated like a *ſtar* from a cloſer *center*, as in *Fig.* 6*. which made *Geſner*[u] think it to be the *Aſtrapias* of *Pliny*, though expreſly he ſays, 'tis of a *white* or *azure*[w], whereas this is always of an *amber* colour: yet draws not ſtraws, is ſomwhat tranſparent, and may therefore paſs for a ſort of *Lapis Lyncurius*; not that it has original from the urine of that *Beaſt*, for we have plenty of the ſtones here and none of the *animals*, but from the unpleaſant ſmell it has when burn'd or brayed; like the urine of *Cats*, or ſuch like ramiſh creatures, whereof the *Lynx* perhaps may be one. Theſe, moſt of them, are made tapering to a point like the former; yet ſomtimes having a blunter ending, and the *chink* on both ſides, I thought fit rather to ſhew it in that form than the other, as in

* Theſe not being hollow at the top, nor containing any other ſtone, gravel, or earth, ſome call the male *Belemnites*: the three former being of the female kind. [u] *De Figuris Lapidum, cap.* 5. [w] *Nat. Hiſt. lib.* 37. *cap.* 11.

Fig. 6.

Fig. 6. where the *cleft* runs not only the whole length of the *ſtone*, but quite under the end, and half way up the other ſide.

43. Many are the *Medicinal* uſes of this *ſtone*, mentioned by *Boetius*, *Aldrovandus*, and *Geſner*: Whereof the chief are, 1. For the *ſtone*, for which (inſtead of the *Eurrhæus*) 'tis uſed in *Spain* and *Saxony*. 2. For *exſiccation* of *wounds* in *Pruſſia* and *Pomerania*. And 3. for *ocular* diſtempers in *Horſes*, in all parts of *England*.

44. Thus having run through the ſuppoſititious *ſtones* from *Heaven*, I next deſcend to the *Atmoſphere*, or inferior Air, immediatly encompaſſing the terraqueous Globe; which though incapable of it ſelf to be repreſented in ſtone, yet having met with ſome related to its *Inhabitants*, I mean the *feathered Kingdom*, I thought fit to give them place before thoſe of the *Waters*.

45. Whereof the firſt and only one, repreſented in *Sculpture Tab.* 3, *Fig.* 7. has perfectly the ſhape of an *Owls* head, which becauſe not mention'd by any Author that I know of, I thought good to exhibit, and call *Lapis Bubonius*; it is a *black flint* within, and *cinereous* without, and was found near to *Hardwick* in the Pariſh of *Whitchurch*.

46. To which I might have annex'd the ſtone *Hieracites*, found frequently in the Quarries in the Pariſh of *Heddington*, but is not the *Hieracites* mention'd by *Pliny* [w], which he ſays alternatly changes its colour; but of *Geſner* [x], to whoſe figure of it, ours is exactly like: but neither his nor ours reſembling any thing of a *Hawks*, or other Birds *feathers*, ſo much as to deſerve a *cut*, or the *Readers* view; I have ſaved *my ſelf* the expence, and *him* the trouble.

47. Next the *Air*, the *ſtones* that concern the *Watery Kingdom*, fall in order of Nature under conſideration, whereof there are ſome that ſeem to be nothing elſe but meerly concreted drops of *water*, found plentifully in the Fields about *Kircklington* and *Northbrook*, which I touched on before under *petrifications*, and promiſed to treat of more largely here. By Authors they are called *Stalagmites*, and ſeem either to be generated of *pearls* of dew, ſetled on the *ſtones* as they lie in the Fields, which firſt being coated over with the ſmall terrene *atoms* that are flying in the *Air*, and by that means kept in their own form for ſome conſiderable

w *Lib.* 37. *cap.* 10. x *De Figuris Lapidum, cap.* 13.

time,

time, are thus at length fix'd into a friable kind of *ſtone*, by the petrifying ſteam that comes from the earth; or elſe they are *exſudations* out of the ſtones themſelves, whence are formed thoſe *excreſcencies* like *warts* in *Animals*: neither of which ſeem unagreeable to their deſcription in *Tab.* 3. *Fig.* 8.

48. But beſide the *Stalagmites*, there are other *concretions* made of much the ſame materials, *viz.* of a cold ſort of *water*, thickned with *terrene* and *petrifying* particles; which yet becauſe of their different mode of generation, have obtained a different, and more ſuitable name: And ſuch are the *ſtones* made of nothing but ſuch *water*, as it drops from the roofs and caverns of the Rocks, and therefore called *Stalactites*, or *Lapides ſtillatitii*; which, if the drops deſcend by the ſides of the Rocks, and comply with the uſual raggedneſs of them, are then indeed of various and the rudeſt forms, and by the work-men called *Craume*[y]. But if the drops deſcend from the top of a vault, or any more prominent part of a Rock, in a direct line and free from the ſides, they are commonly then of a *pyramidal* form, as in *Tab.*3. *Fig.* 9. which is the repreſentation of a *ſtone* of about nine *inches* long, of a yellowiſh colour, as it hung from the Rock in *Heddington* Quarry, where without doubt it was produced much after the ſame manner, as *Iſicles* at the ends of ſpouts in Winter, by a gradual deſcent and congelation of the drops.

49. Hither alſo muſt be referred all ſorts of *Spars*, by the *Miners* called *Cawke*, and the *Latins*, *Fluores*; which (ſay they) yet retain ſo much of a *fluid*, that with the heat of fire, like *Ice* in the *Sun*, they melt and flow: an effect, which though I could not find it had upon ours without the help of *Salts*; yet not doubting at all, but that once they had been *fluids*, I could not but accordingly give them place here.

50. Whereof, there is ſcarce any Rock whatever, whether *metalline* or *vulgar*, which has not ſome kind or other of them, ſhot in its ſeams or other hollows, which according to their different ſubjects or *matrixes*, are ſomtimes of different *colours*, and frequently of divers *figures*.

51. As for *colours*, I have not obſerved above two ſorts in *Oxford-ſhire*, a light yellow, and a Pearl-colour'd white, where-

[y] Of this there is a Quarry between *Heathrop* and *Enſton*, called *Broad-ſtone* Quarry, that has great plenty.

of

of there are ſome in the Quarrys near *Shotover*, ſo clear and hard, that they come not much behind the *Briſtol-Stones*, and are in figure (though had from the ſame Quarry) as various as *Diamants*; ſome of them being compriſed in *ſeven*, others in *nine*, others in *eleven*, and ſome in *thirteen* planes, as may eaſily be computed from their *trigonal*, *tetragonal*, *pentagonal*, and *hexagonal* pyramids, repreſented in *Tab.* 3. *Fig.* 10. to which, adding the *planes* of their *columns*, and the *planes* of their *baſes*, whereby they are fix'd to their ſubjects, thoſe numbers of *Hedræ* muſt needs be concluded.

52. As to the *origin* and *texture* of *Spars*, I take them to be much of the ſame with *Chryſtals* (though we ſeldom find them of their *hexagonal figure*, or their *columns* ever interceding two *pyramids*) and that they differ in luſter and hardneſs according to the more cloſe or looſe *texture* of the *ſtones* whereon they ſit, and out of which they have ſweat, as through a *ſtrainer* or *colander*. Though it muſt not be denyed, but what is aſſerted by the ingenious and obſerving *Steno*[z] concerning *Chryſtals*, may have place alſo in the increaſe and growth of theſe, which he ſays (whatever may be the manner of their firſt delineation) is by external appoſition of new *Chryſtalline* matter to the external *planes* of the already delineated *Chryſtal*; which he alſo obſerves, not to be joined to all its *planes*, but for the moſt part to the *planes* of the top only; nor to theſe all at a time, nor in the ſame quantity. Whence it is, that the extream or top *planes* of *Spars* as well as *Chryſtals*, are ſeldom or never equal, and not always *triangular*, but riſing with unequal *ſides* and *angles* from the *planes* of their *columns*, as in that ſeparate piece of *Spar* or *Chryſtal* near *Fig.* 10. which I take to be *arguments* ſufficiently concluding the *ſimilitude* of their growth and *texture* of parts, notwithſtanding the *planes* of the *columns* of *Spars* are not ſtreaked, nor ſo plainly ſhew the places of appoſition, as they do on *Chryſtal*; which ſtreaks, for the *Readers* more ready apprehenſion, are therefore cut on the ſeparate *column* near *Fig.* 10. though otherwiſe indifferently to be underſtood either for *Spar* or *Chryſtall*.

53. Some of theſe *Spars* fall ſo little ſhort, either of *Chryſtals* or *Briſtol Diamants*, either in *luſter* or *hardneſs*, that we may very well admit what is ſaid of them by *Aldrovandus*[a], that they are *gemmæ inchoatæ*, *& non perfectæ*. And that *Boetius*[b] in all likely-

[z] *Prodrom. de Chryſtallo propoſitionib.* 1, 2, 3. [a] *Muſæum Metall. lib.* 4. *cap.* 76. [b] *De Lapid. & Gem. cap.* 304.

hood may have hit the mark, who doubts not but they are made of the ſame matter with *Gems*, and therefore gives them place between *Gems* and *Stones*, *Inter Gemmas & lapides medium locum obtinent fluores*, ſays he: to whom in this matter I readily ſubſcribe, finding many of them to participate with *Gems* in luſter, but with other *Stones* in ſoftneſs and brittleneſs; whence it comes to paſs, that they will not poliſh like other ſtones, and are only fit to be mix'd with other metals, which they render much more quick in *fuſion*, than otherwiſe they are inclined to be of themſelves.

54. After *Stones* ſo purely made out of *Waters*, that they readily return into *fluids* again, or have only ſuch figures, into which that *Element* ſeems moſt naturally to compoſe it ſelf, as the *Stalagmites* and *Lapides ſtillatitii*; come we next to ſuch as repreſent its Inhabitants, the *Fiſhes* of the *Sea* and *freſh Watets* too: of which there are ſome of ſo great variety of texture, that in caſe they were not heretofore the ſpoils of real *Fiſhes* indeed, and now petrified, require a much higher principle for their efformation; concerning which before we attempt any thing, let us firſt conſider ſome of their particular ſhapes, with the places and poſtures they are now found in.

55. Of ſuch as reſemble any of the *freſh water* kind, I have met with only *one* in this County, which did we but know where elſe to put it, ſhould not be placed here neither; for it was taken out of a block of *coal* (whereof there is none dug in *Oxford-ſhire*) by the ingenious and obſerving Sir *Thomas Pennyſton*, at his Houſe at *Cornwell*; and ſeems to repreſent a *Carp* or *Barbel*, the beſt of any Fiſh I have yet compared it with, and rather indeed the latter of the two, becauſe of the ſhort and thick ſcale: It was broken, in taking it out of the Coal, into ſeveral pieces, whereof that is *one* exactly engraven *Tab.* 3. *Fig.* 11. kindly beſtowed on me by that worthy *Gentleman*, and by whom the reſt are carefully preſerv'd; which were it not for want of the variety of colours, I ſhould take (for the ſcales ſake) to be the *Lepidotes* of *Pliny*[c].

56. The *ſtones* that we find in this In-land Country, having the ſhapes of *Sea fiſh*, are many, but chiefly of the *teſtaceous* kind; whereof there are ſome that lie in a maſs of ſtone together, and

[c] *Nat. Hiſt. lib.* 37. *c.* 10.

others

others found in the Fields or Quarries apart. Of the firſt ſort of theſe we have a curious inſtance in the poſſeſſions of the Right Honorable *Henry* Earl of *Clarendon*, at *Langley* in the confines of *Whichwood-forreſt*, where there is a Quarry of very hard ſtone, wholly compoſed of a cloſe union of *Cockles*, ſcarce any of them exceeding a Pea in bigneſs, and ſtreaked circularly to the hinges of the valves, as in *Tab.* 3. *Fig.* 12. they are none of them hollow, but firmer within, than they are to the bed of ſtone where they lye; and yet even to that they are ſo cloſely knit, that the maſs receives a very good poliſh, inſomuch that his *Lordſhip* intends to pave the new *Chappel* now building at *Cornbury* with it.

57. This ſort of Marble is mention'd by *Steno*[d], and called (as he ſays) by the *Italians*, *Nephiri*; whereof there is alſo a very good ſort at *Charleton* Towns end, upon the edge of *Otmoor* *, differing from that of *Langley* only in this, that the groſs of the ſtone is ſomwhat whiter, the *Cockles* larger, and not ſo thick ſet. However, of ſo firm and cloſe a texture, that of it they make *Tomb-ſtones*, *Tables*, *&c*, ſo curiouſly ſpotted and ſet with rings, that it very much pleaſes the eye of the beholder, and has already gotten (though but lately found) a reputation at *Oxford* and the parts adjacent.

58. Of this ſort of *ſtone* moſt certainly it was, though ſomwhat perhaps of a ſofter kind, and different colour, that *Pauſanias* informs us (as quoted by *Agricola*) the Monument of *Phroneus*, and many other works, were made at *Megara*. *Megaræ in ſaxo valde albo, & reliquis lapidibus molliore, undique inſunt conchæ marinæ, ex quo &c.* are the words of *Agricola*[e]; for which very reaſon this ſort of ſtone is there called *Conchites*, and ſince by *Johnſton* and *Fred: Lachmund*[f] (from the place where found) *Lapis Megaricus*.

59. There is another ſort of it in the Quarries near *Adderbury*, thick ſet with *Cockles* in their full proportion, as in *Tab.* 3. *Fig.* 13. Some of them are wonderfully Chryſtallized, and beautiful to the eye, but not being ſo finely cemented together, but that a knock will looſen or make them leap from their beds; and many of them being hollow, or filled with brittle *Spar*; the ſtone by no means will receive a poliſh, and upon that account fit for no other work

[d] *In Prodromo.* * It is much prized by the *Painters* at *London*, it having a grit that cuts their colours much better than other Marble. Mr. *Aubrey*'s notes. [e] *De Natura Foſſilium. lib.* 7. [f] Ὀρυκτογραφ. *Hildeſheim. ſect.* 3. *cap.* 15.

than to mend the *high-ways*, or ſome other mean uſes. Nor can I inform the *owners* of theſe Quarries of any better that it may have, except they ſhall think fit to burn it for *Lime*, for which I dare promiſe it muſt needs be excellent.

60. And ſo is the ſtone *Oſtracomorphos*, made of heaps of *Oyſters* cemented together, and found plentifully enough on *Shotover hill*, not far from the way to Sir *Timothy Tyrrils*; of which I have forborn to give any *draught*, it being eaſily conceived from the manner of the *Cockles* thus heaped together in the two former *cuts*.

61. To theſe ſucceed the *ſtones* reſembling *Sea-fiſh* of the *teſtaceous* kind, not found in *cluſters* after the manner of the former, but in a ſeparate ſtate: of theſe there are ſome curiouſly lineated, and others plain, with but few or no ſuch ornaments, which yet I muſt treat of promiſcuouſly together, becauſe there are of both ſorts in ſeveral *ſpecies*.

62. Of theſe again ſome are of a *turbinated* form, and others *bivalvular*, reſembling the double ſhell'd kind, joyned together with a hinge, and yet theſe ſomtimes found all with their ſhells apart, and ſomtimes again none of them ſo.

63. Amongſt theſe the *turbinated* or *wreathed* kind of *ſtones*, by the *Greeks* called *Strombites*, from τρέφω *torqueo*, to wreath (which is always *helically*, and for the moſt part from the right hand to the left, and *ſpirally* from a greater to a ſmaller ending) are but ſeldom found: However, I have met with both the ſorts of *Agricola*[g], the greater, which he ſays is ſomtimes nine inches long, but ours indeed not much exceeding five, of a plain *ſuperficies*, as in *Tab.* 4. *Fig.* 1 *. and the leſſer wanting of half an inch in length, but curiouſly ſtriated, as *Fig.* 2. both found in the Quarries in the Pariſh of *Heddington*, of a cinereous colour, ſomwhat inclining to yellow, and of a harder conſiſtence than the ſtone wherein they lye.

64. But as for ſuch as repreſent the *bivalvular Conchæ*, ſuch as *Cockles*, *Eſcallops*, *Oyſters*, *&c.* we have very great plenty, as well of kinds as individuals. The *Conchites* or Cockle-ſtones found in this County, may alſo be divided into the greater and leſſer; whereof the greater are ſome of them ſtriated with large *ſtriæ*,

[g] *De Natura Foſſilium, lib.* 7. * *Vid. Buccinum lapideum lævo Fabii Columnæ, Aquatilium & terreſtr. obſerv. cap.* 22.

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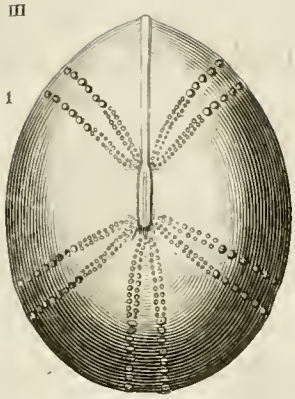
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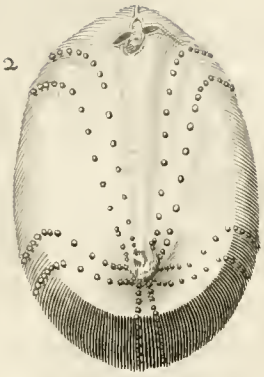
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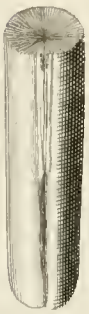
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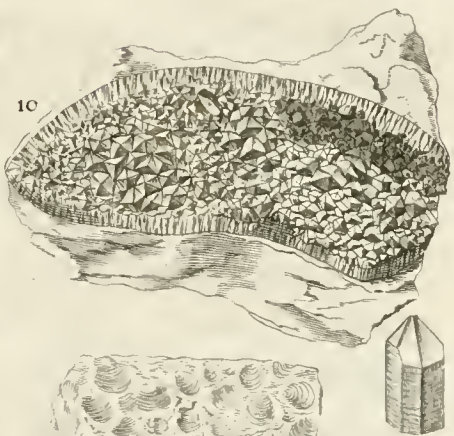
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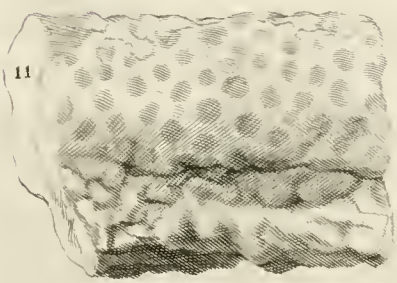
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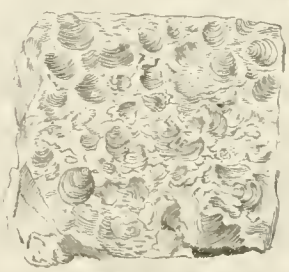
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13

To the right Hon^ble
Henry Earle of Clarendon
Viscount CORNBURY &
Baron HYDE of Hindon &c
This Table
of formed STONES (whereof the 12th sort
is dug in his LORD^Ps own Lands) in
memory of his LORD^Ps many and great
favours, is gratefully consecrated
by R. P. L. L. D.

Michael Burghers Delin: et sculp:

and larger *furrows*, deſcending as it were from a *center* at the top, and expanding themſelves to the *rim* of the ſtone; having alſo ſix or ſeven *tranſverſe ſimple lines*, bent circularly to the hinge or commiſſure of the *valves*, as in *Tab.* 4. *Fig.* 3. which is a *ſtone* without, of a dark *cinereous* colour, but within, a *black flint*; found ſomwhere in the *Chiltern* about *Henly* upon *Thames*, and kindly beſtowed on me by the ingenious Mr. *Munday*, Phyſitian there.

65. Some there are again, whoſe *ſtriæ* alſo deſcend from the hinge or commiſſure, but not in ſtraight lines, but bent and undulated, and much broader than the former, as in *Tab.* 4. *Fig.* 4. which though in magnitude it fall ſhort of the *Concha Tridacna* of *Aldrovandus* (ſo called it ſeems becauſe they made three mouthfuls apiece) yet in form it ſhews to be ſo very like, as may be ſeen alſo in *Jonſton*, *Tab.* 13. that were it not a *Stone*, I muſt pronounce it the ſame[h]. This I found at *Great Rolwright* in a bluiſh clay, whereof, and of nothing elſe, it ſeems to be concreted; for it do's not much exceed it in hardneſs, and ſtill participates moſt of that colour, though covered with a bright and ſhining *ſubſtance*, by the Naturaliſts called *Hoplites*, or *Armatura*: of which more anon when I come to *Cornu Ammonius*, a ſtone, the moſt of any adorned with that *ſubſtance*.

66. Another ſort there is found at *Heddington* Quarries, whoſe lines or *ſtriæ* are not drawn like the two former, from the commiſſure of the *valves* to the *rim*, but tranſverſly and circularly from one ſide of the ſtone to the other; the leſſer circles having place next the *commiſſure*, and the greater next to the *rim* of the ſtone, as in *Tab.* 4. *Fig.* 5. which ſeems much to reſemble the *Concha rugata* of *Rondoletius*[i], with *valves* ſwelling very high; of colour it is cinereous, inclining to yellow, not hollow within, but a ſolid *ſtone*, and of much the ſame texture with the rubble of the Quarry.

67. Of the ſmaller *Conchites* there are alſo ſeveral ſorts, differing in *colour*, *lineation* and *valves*; for at *Teynton* and about *Burford*, where they are found in the Fields, they are moſt of them *yellow*, with their *valves* riſing high and approaching to a round *: but at *Glympton*, where they are only found in a ſpring that riſes

[h] *Vid. Concham imbricatam minimam Aldrovandi. de Teſt. lib.* 3. *cap.* 43. [i] *Rondoletius de teſtaceis, lib.* 1. *cap.* 25. * Theſe made red hot and put into drink, are accounted in this Country a preſent remedy for a ſtitch.

in

in a Wood about a mile Southward from the Church, they are much more depreſſed and of a *cinereous* colour; but both having their lineations from the *commiſſure* to the *rim*, they are both therefore repreſented under one draught, *Tab.* 4. *Fig.* 6.

68. How it ſhould come about that theſe *Cockle-ſtones* of *Glympton* ſhould only be found at the Fountain-head, and no where lower in the ſtream, nor that I could hear of, in the Fields about, I muſt acknowledg to be a knot not eaſily looſed. Some have thought them brought out from amongſt the Rocks, at the bottom of the hill where the Spring riſes; others that they are formed by a peculiar virtue of the water, as it runs over the rubble ſtones that lye near its *exit:* for, ſay they, if you pick them never ſo clean away, in few months time you ſhall have as many more. And indeed it muſt be confeſt, that I met with ſeveral that were only ſtriated on one ſide, and rubble ſtone on the other; and ſome of them but juſt begun to be a little lineated: However it be, I ſhall determine nothing yet, having imployed a careful and ingenious perſon to watch the increaſe and lineations of theſe *ſtones*, which when throughly underſtood, ſhall be faithfully communicated.

69. Beſide thoſe of *Glympton*, there are others at *Cornwell*, in the Park of the Right Worſhipful Sir *Thomas Pennyſton*, found in a bank of yellowiſh clay, of a much different form, and tranſverſly ſtriated, as in *Tab.* 4. *Fig.* 7. which though indeed for the moſt part are hard ſtones, yet I was ſhewed ſeveral by the Ingenious *Owner* of the place, that were nothing but clay, not differing at all from that in the bed wherein they lye, and out of which they ſeem to be formed, but in *figure* only; which is alſo different from all the *bivalvular Conchæ* that I find in Books, or have ſeen in collections of that ſort of Shell-fiſh.

70. And ſo is the figure of the *Conchites* found in *Hornton* Quarry, near approaching to an oval, and ſcarce ſtriated at all; which inclines me at leaſt to doubt, if not certainly to conclude, that theſe *Cockle-like ſtones* were never heretofore any real *Cockle-ſhells*, thus tranſmuted by the penetrating force of petrifying juices, but that moſt of them (as the ingenious Mr. *Liſter*[k] thinks) ever were, as they now are, *Lapides ſui generis*, differing not only from one another, but many of them from any thing in Nature

[k] *Philoſoph. Tranſact. Numb.* 76.

beſide,

beſide, that the freſh or ſalt-water can any where afford us. But before I engage in this great controverſie, let us firſt conſider a few more of theſe *ſtones* reſembling *ſhell-fiſh*.

71. And firſt, the above-mention'd *Conchites* found in *Hornton* quarry, and repreſented in *Tab.* 4. *Fig.* 8. which is not a ſolid *ſtone* within (as all the *Cockle-ſtones* hitherto deſcribed have been) but hollow, and filled with *ſpar*; ſomtimes ſhot into irregular figures, but for the moſt part forked, as in *Fig.* 9. the *baſis*, or place where the branches of the fork are conjoyned, being rooted (in all that I have yet ſeen) at the *commiſſure* or hinge of the *valves*, and the branches extending themſelves in the broader parts of the *Conchites*; of which operation of Nature I can give no other account, but that it was firſt obſerved, by the Reverend and Ingenious Mr. *Clark*, Rector of *Dreyton* near *Banbury*, from whom, beſide other favors, I received many of them.

72. After the *bivalvular Cockles* found always with their *valves* cloſed together, come we next to conſider the other *Bivalves* found never ſo, but their *valves* always apart. And ſuch are the ſtones reſembling *Eſcallops*, and ſome other ſtriated *Conchylia*: whereof that repreſented *Fig.* 10. is the moſt curious in its kind I ever yet ſaw, found in *Heddington* quarries by Mr. *Richard Stapley*, an ingenious young Man, and learned in theſe matters, to whom I am beholding not only for this, but for ſome other choice *ſtones* hereafter to be mention'd. Which amongſt all the *Pectines* or *Eſcallop-ſhells* I could find in the *Ichthyographers*, beſt reſembles the *Pecten aſper* of *Aldrovandus*[1]. Of colour it is yellowiſh, eared on both ſides, the lineations from the *commiſſure* to the *rim* of the ſtone very prominent, and yet having ſome other *tranſverſe* lines (not bending to, but from the *commiſſure*) ſtanding upon them, and not paſſing through the deep furrows ſo as to joyn with each other,

73. As the *tranſverſe* lines do in the next following *Pectinites*, *Fig.* 11. where they are both of equal depth, and very ſmall, thick and fine; the *tranſverſe* lines all of them bent to the *commiſſure*, but the other *ſtriæ* not meeting together in it, as in the former and following *Eſcallops*: This ſtone is of a light reddiſh colour, eared on both ſides, and found in the quarries in the pariſh of *Heddington*.

[1] *De Teſtaceis, lib.* 3. *cap.* 69.

74. And

74. And so was the next *stone* in form of a *Pectunculus*, or little *Escallop*, *Fig.* 12. of a whitish yellow colour, the *striæ* large and broad, but the *transverse* lines small, eared like the former on both sides: Which also argues, that this stone was never heretofore the shell of a Fish, and thus cast into stone by an *Animal* mold. For the *Pectunculi*, says *Rondeletius* [m], are a distinct *species* from the *Pectines* or larger *Escallops*, and never have ears but on one side, which indifferently are either on the right or left; except that we shall say that this was once the shell of a young *Pecten*, not yet come to its full growth.

75. To this also may be referr'd *another* of the same texture, only somwhat bigger, and wanting the *ears* of a *Pectunculites*, or little *Escallop-stone*, *Fig.* 13. which because it shews no signs of its *ears* being broken off, I suppose may either represent the *Chama striata Pectiniformis* of *Aldrovandus* [n], or else the *Pectunculus* of *Bellonius*, which (as quoted by the *Zoographer Gesner* [o]) he not only says has no ears, but has exhibited it in Sculpture.

76. And so perhaps may the next *stone*, *Fig.* 14. except we shall rather make it the first of the *Conchites Striati*, or streaked *Cockle stones*, which indeed I cannot chuse but assent too, because of its bearing too much on one side, which I find the *Pectinites* or *Escallop stones* do not: and because it cannot be a *Tellinites*, which shell-fish (if at all) is never streaked that way. Let it therefore pass only for a streaked *Cockle Stone*, which are plentifully found not only at *Heddington*, and about *Shot-over*, but in the Quarries near *Stunsfield*, *North Leigh*, and *Little Milton*; and are placed here, because found like the *Escallop stones*, always with their shels apart.

77. Whereof there are some larger, and as it were heaped upon one another, as in *Tab.* 4. *Fig.* 15; and others single, as in *Fig.* 17. The real *shell-fish* of which kind, called *Conchylia striata*, though thus lineated without, are always, says *Aldrovandus* [p], plain and smooth within, contrary to what we find in these *Conchites striati*, as is shewn by *Fig.* 16. which shews the in-side of one of those stones, not only lineated from the *commissure* to the *rim*, but adorned also with four or five *transverse fillets*, not made of *one*, but several conjoyned *lines*, which seems also to conclude

[m] *De Testaceis, lib.* 1. *cap.* 16. [n] *De Testaceis, lib.* 3. *cap.* 69. [o] *De Aquatil. lib.* 4. *p.* 813. [p] *De Testaceis, lib.* 3. *cap.* 44.

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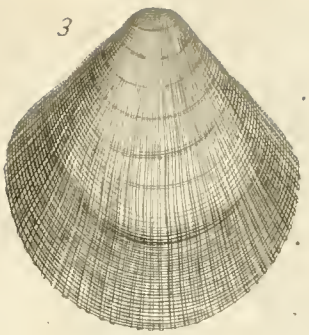

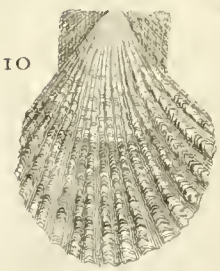

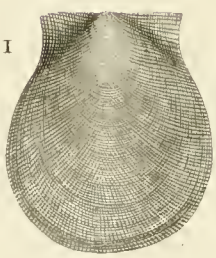

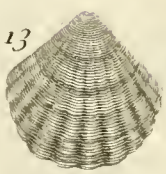

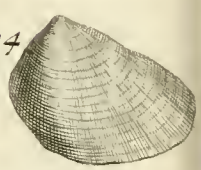

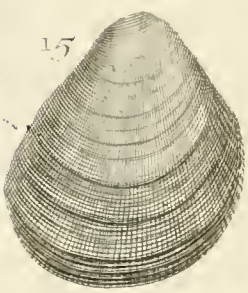

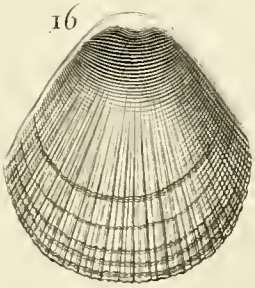

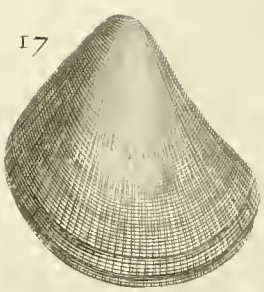

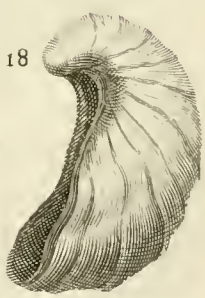

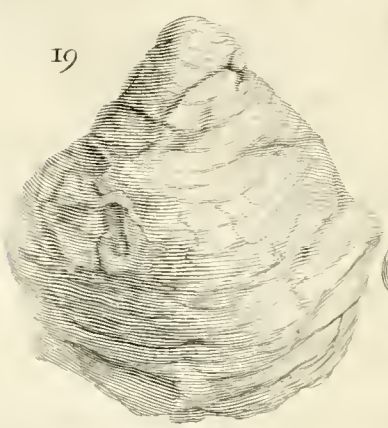

To the right Honble
ARTHUR Earle of ANGLESEY
Viscount Valentia Baron of Newport
Pagnel, Mount Norris &c lord Privy SEALE &c
This 4th Table
of formed STONES representing
SHELL-FISH of the Testaceous
kind is humbly offerd by
R. P. LL.D.

Michael Burghers sculpt.

delineavit

it to be *Lapis ſui generis*, and not to have been molded by a ſtriated *Cockel-ſhell*.

78. Beſide *Cockle* and *Eſcallop-ſtones*, there are others that ſeem to be of the *Oyſter* kind, found plentifully in the Gravel-pits without St. *Clements*, in *Cowley-common*, and in a *wood* near *Wood-eaton*: amongſt them there are ſome of an *oblong figure*, very thick, and of a bluiſh colour, ſuch as that depicted *Fig.* 18. which I gueſs may be the ſame with the petrified *Concha oblonga craſſa*, mentioned by Dr. *Merret* [q], found in *Worceſter-ſhire*, and there called *Crow-ſtones*, *Crow-cups*, or *Egg-ſtones*; or elſe the more protuberant part of the *Mytulus niger* of *Aldrovandus* [r], or the *Mytulus* of *Rondeletius* [s].

79. But others are again of the true *Oyſter ſhape*, called *Oſtracites*, or ὀστρεον, repreſented *Fig.* 19. ſome whereof are *blue*, and others *reddiſh*, of the colour of the Gravel out of which they are taken: Theſe are generally greater, thicker and weightier, than the true *Oyſter-ſhell*, yet like them ſeem to be reſolved, according to the opinion of *Steno* [t], into many *little ſhells*, the innermoſt being always the *greateſt*, and the outermoſt the *leaſt*: Upon which very account I could eaſily have aſſented, that theſe, and the former, might once indeed have been *ſhell fiſh*; but that we only find (juſt as in the *Eſcallops*) the *protuberant* parts of the *ſhells*, and never any of the *flat ones*; which had they been once *fiſhes*, we have little reaſon to think, could have been thus abſent from them.

80. We find alſo in *Oxford-ſhire* a ſort of *Mytuloides*, or *Muſcle-ſtones*, of an odd kind of figure, and not eaſie perhaps to be parallel'd, though the *teſtaceous Kingdom* be of large extent: They are not hollow, but within a *terra lapidoſa* of a yellowiſh colour, and cover'd without with a white ſhining kind of *Armature*, with *ablong lineations* agreeable to the figure of the *ſtone*, as in *Tab.* 5. *Fig.* 1. found in digging a Well in the Pariſh of *Cleydon*. To which we may add another ſort remarkably ſmall, found in *Heddington* Quarries, *Fig.* 2. which finiſh my diſcourſe concerning ſuch *ſtones* as reſemble the ὀστρακόδερμα, or *teſtaceous ſhell-fiſh*. Whence I proceed

81. To *ſtones* repreſenting the μαλακόδερμα, or the *ſhell-fiſh* of

[q] *Pinax rerum Natur. Brit. p.* 216. [r] *De Teſtaceis, lib.* 3. *cap.* 71. [s] *De Teſtaceis, lib.* 1. *cap.* 46. [t] *In Prodromi verſ. Angl. p.* 75, 76.

the ſofter *cruſtaceous kind*, ſuch as that *Tab.*5. *Fig.*3. in ſubſtance and hardneſs much like a *Pebble*, and of colour *yellowiſh*: divided firſt by five pretty ſtraight *lines*, adorned on each ſide with double ſets of *points*, aſcending from a *protuberant umbilicus* in the *baſis* of the *ſtone*, to another of like form at the top, but *foliated* round in manner of a *Roſe*: And after again ſubdivided by five other *indented lines*, terminated before they reach the *umbilici*; by which means the ſpaces between theſe lines are all *pentagons*, like the outer ſcales of ſome ſort of *Tortoiſe*. Much ſuch another *ſtone* as this I find in *Aldrovandus*, in his Book *De Teſtaceis* [u], which becauſe he thought reſembled the *ſea Urchin* deprived of its outward prickly coat, he calls *Echinus lapis ſpoliatus à ſuis ſpinis*: But it ſeeming to me to be much more like the *Eſtrice marino*, *ſi ritrava nelli mari profondi*, of *Ferrante Imperato* [w], I chuſe rather to call it *Hiſtricites*, or *Porcupine-ſtone* without briſtles. This was found in the *Chiltern* Country, near *Stonor-houſe*, and ſent me by the Worſhipful *Tho. Stonor* Eſq; the Proprietor of the place, and one of the *Nobleſt Encouragers* of this Deſign.

82. And ſo was the following curiouſly embroider'd *ſtone*, *Fig.*4. much reſembling the petrified *Riccio marino*, or *ſea Urchin* of *Imperatus* [x], found in the ſame place alſo without *prickles*, but much differing from the former in colour and ſubſtance, as alſo from the *ſtone* of that Learned Author: For whereas he confeſſes *that* was but of the conſiſtence of the *Lime-ſtone*; ours, though without of a *whitiſh cinereous* colour, within is a hard *black flint*, covered over with thin glittering plates, ſet edg-ways to the ball of the flint, out of which thoſe uniform *eminencies* and *depreſſures*, thoſe *waved* and *tranſverſe lineations* are all framed.

83. Theſe are found in great plenty in the Iſle of *Malta*, and by the Country men there, ſays the Ingenious *Boccone* [y], called *Mamelles de Saint Paul*, becauſe of the lenticular *eminencies* and ſmall *roundures*, that fill the whole ſurface of the *ſtone*; or rather becauſe they are ſomtimes found coupled two and two, as may be ſeen in the *ſculptures* of the ſame *Author*. By *Boetius* and *Geſner*, and all the old *Authors*, they are called *Ova anguina*, Serpents eggs; perchance becauſe from the *baſis* there iſſue as it

[u] *De Teſtaceis lib.*3. *cap.*40. [w] *Dell' Hiſt. Naturale, lib.*28. *cap* 1. [x] *Dell' Hiſt. Naturale, lib.*24. *c.*26. [y] *Recherches & obſervat.ons Naturelles: Lettre vingt ſixieme.*

were

were five *tails* of *ſerpents*, waved and attenuated toward the upper part of the *ſtones*. They tell us alſo a ſtory of its being engendered from the *ſalivation* and *ſlime* of *ſnakes*, and caſt into the Air by the force of their *ſibilations*, where if taken, has effects as wonderful as its generation, and therefore of great eſteem amongſt the *French Druids*. But I care not to ſpend my time in *Romance*, and therefore proceed

84. To another *Echinites*, reſembling the inner ſhell of the *Echinus ovarius* or *Eſculentus*, ſo called from a ſort of *quinquepartite* or *ſtellated eggs*, that this kind of *Echinus* has within it good to eat. Their outermoſt coat is full of *ſharp prickles*, upon which account they are ſomtimes called *Chaſtaignes de Mer*, or *ſea Cheſnuts*, becauſe of their likeneſs to rough prickles that encompaſs Cheſnuts whil'ſt they are on the Tree; for which very reaſon they are alſo called *Heriſſons de Mer*, *ſea Hedg-hogs*, and *Cardui Marini*, *ſea Thiſtles*: which rough coat of theirs, when the Fiſh is dead, coming off from them, they then diſcover their *inward ſhell* of that *curious workmanſhip*, that is lively repreſented by our *ſtone*, *Fig.* 5. made up of ſo many *compartements* and *eminencies*, and ſo regularly diſpoſed, that, ſays *Monſieur de Rochefort*[z] (who calls them alſo *Pommes de Mer*, or *ſea Apples*) the moſt ingenious *Embroiderer* would be much troubled to imitate them. This *Echinites ovarius* was found in the Pariſh of *Teynton*, and ſent me by my worthy and ingenious Friend Mr. *Robert Veyſey*, to whom alſo I am beholding for many other matters mentioned in this *Eſſay*.

85. From *Teynton* alſo was ſent me another of this kind, but much ſmaller, not exceeding the *Rouncival pea*, or *French Halſlet* in bigneſs; and yet with lines of *compartement*, and other *eminencies* as large as the former, but much fewer in number: to which, whether there be any *Animal* in Nature whoſe *ſhell* will exactly, or for the moſt part correſpond, I much queſtion; wherefore that it may be examined both at home and abroad, I have cauſed it to be engraven, *Fig.* 6.

86. To which add a *fourth* ſort with its *prickles* ſtill on, found plentifully in the Quarries near *Shotover-hill*, very like to the *fifth* ſort of *Echinus* of *Ariſtotle*, as depicted by *Rondeletius*[a], whoſe *inward ſhell* it ſeems is very ſmall, but its *prickles* long and ſtub-

[z] Hiſtory of the Iſles *Antilles*, or *Caribby* Iſlands, *chap.* 19. *art.* 13. [a] *De Piſcibus*, *lib.* 18. *cap.* 33.

born, found always in the deepeſt waters, and ſticking to Rocks, much after the ſame manner as here repreſented in ſtone, *Fig.* 7. which in conformity to *Ariſtotle* may be called *Echinites minutus*. And this had ended my Diſcourſe of Stones reſembling *Shell-fiſh* of the *cruſtaceous* kind, but that I am admoniſh'd by the Learned, and deſervedly Famous *Virtuoſi*, Mr. *Hook*[b] and Mr. *Ray*[c], and ſince them by the Ingenious *Sicilian Gentleman Monſieur Boccone*[d],

87. That the *ſtone* commonly ſtiled *Cornu Ammonis*, alſo belongs to this place, as being nothing elſe but the petrified *ſhell* of the *Nautilus*, or *Coquille de Porcellain*; or as *Rondeletius*[e] calls it, the *teſtaceous Polypus*. Of theſe we find plenty in the County of *Oxford*, of different *colours*, *figures*, *cizes*, but all ſo curled up within themſelves, that the place of the *head* is always in the *circumference* and the *tail* in the *center* of the *ſtone*, and therefore by the Ancients called *Cornua Ammonis*, for that they reſembled the curled horns of the *Ram*, worſhipp'd by the name of *Jupiter Ammon* in the deſarts of *Africa*[f]; to whom *Alexander the Great* having declared *himſelf Son*, that he might be the more like ſo inhuman a *Father*, he aſſumed the *horns* of the *Ram Deity*, as may be ſeen on the *Impreſſes* of ſome of his *Mony*. And ſo did *Lyſimachus* that ſucceeded him in *Thrace*[g], *Attila* the *Hun*, and ſome other *proud Princes*.

88. The places in this County moſt remarkable for this *ſtone*, are 1. The City of *Oxford* it ſelf, where, in digging *cellars*, *foundations*, *&c.* chiefly in the eaſtern parts of it, they are commonly met with; whereof ſome are ſmall, the parts *protuberant*, and ſwelling to a round, as in *Tab.* 5. *Fig.* 8. others broader and more *depreſſed*, as in *Fig.* 9. but the *lineations* of both *waved*, and extended from toward the *center*, to a ſingle edged *ridge* in the back of the *ſtone*: and therein different from a *third* ſort found alſo at *Oxford*, whoſe *lineations* are larger, not ſo thick nor waved, and terminated at great *protuberances* on each ſide of the *ſtone*, between which, on the broad back of it, there intercede other *lineations*, the whole body of the *ſtone* being alſo divided by *Sutures*, in form much reſembling the leaves of *Oak*, as in *Fig.* 10. The two latter of *theſe* are both *perforated* at the *center*, and there-

[b] Micograph. Obſerv. 17. [c] Obſervations Topograph. *p.* 123. [d] *Recherches & Obſervations Naturelles, Lettre* 28. [e] *De Piſcibus, lib.* 17. *cap.* 9. [f] *Quint. Curtii de reb. Geſt. Alexandri, Hiſtor. lib.* 4. [g] See the Cabinet in the *Bodleyan* Library.

fore

fore called by *Bauhinus* [h], *Cornua Ammonis pertuſa*: And all three adorned with a ſhining braſen *Armature*, in luſter equalling that *metal* it ſelf, yet of which in ſubſtance it has nothing leſs, though *Agricola* have affirmed it to be *naturæ rudimentum id metallum facere diſcentis.*

89. *Boetius de Boot*, in his Book *de Lapidibus & Gemmis* [i], thinks the *ſtone* it ſelf naturally of a *ferrugineous* colour, which lying in an Earth ſated with an *aluminous* juice, is changed thereby into this *braſen* colour. To which *de Laet* [k] in his Supplement, adds, *atramentum ſutorium*; both which, he ſays, joined, give that colour to *Iron*. For my part, I rather think it may be performed by *Nature*, much after the ſame manner they guild *money* at our *Engliſh Baths*; if ſo, there will be requiſite ſomthing *urinous*, which they always add *there* to ſuperinduce ſuch a colour, whereof more at large when I come into *Somerſet-ſhire*.

90. The ſecond place eminent for production of theſe *Stones*, is the Pariſh of *Cleydon*, where they find them of many more *turns* than thoſe at *Oxford*, though not much bigger; without *Armature*, of a *yellowiſh* colour (like the *Aſteriæ* before mention'd found at the ſame *place*) and differently *ſtriated*, as in *Fig.* 11. in which the *ſtriæ* from the innermoſt part of the *ſtone* are all ſingle, but many of them divided before they reach the *rim* of it, where they are terminated with a back much more *protuberant* than the reſt of the *ſtone*, but alike *ſtriated*.

91. Near *Thame*, in the Fields Eaſtward from the *Church*, they ſomtimes meet alſo with the *Cornu Ammonis*, *ſtriated* ſingly like the former, near the inner part of the *ſtone*, and preſently dividing, but without *termination* either at any *ridge*, or other *protuberancies* in the back; the diviſion being continued to the other ſide of the *ſtone*, where 'tis made again into one common *lineation*, as in *Fig.* 12. Of which ſort I had ſome *arches* or parts ſent me alſo from *Chiſlehampton*, by the Right Worſhipful Sir *John D'Oyly* Baronet, in whom flouriſh all the *Virtues* of that ancient *Houſe*. But theſe (not like the former) a hard *ſtone*, but ſome of them a kind of *Terra lapidoſa*, or hardened yellow *clay*, one degree perhaps above that of the bed wherein they lay; which (beſide Sir *Thomas Pennyſtons* clay Cockles) ſeem to overthrow

[h] *Joann. Bauhinus de Lapidibus variis in fine Hiſt. admirabilis fontis Bollenſis.* [i] *Cap.* 246. [k] *De Lapid. & Gemmis, cap.* 22.

Steno's

Steno's[1] firſt conjecture concerning theſe matters: *That they are always found in the ſame place, of the ſame conſiſtence; and that there are no ſigns amongſt them of ſooner or later production.*

92. And ſo do the *Ophiomorphit*'s found in a bluiſh clay in the Pariſh of *Great Rolwright*, Eaſtward from the *Church*, whereof ſome are ſo ſoft, that 'tis eaſie to preſs them aſunder with ones fingers; and others a hard *bluiſh ſtone*. But though they agree with the former in the manner of *production*, they differ as much in the manner of their *lineations*, for whereas their *ſtriæ* were divided near the rim, ſome of the *lineations* of theſe come together there, and are united in pretty large *protuberant knobs* on each ſide the back of the *ſtone*, which in theſe being broad and ſomwhat riſing, is croſſed by other *arched* lines that intercede the *eminencies*, as in *Fig.* 13.

93. Other *Ophiomorphit*'s there are, that have only ſtraight ſingle *ribs*, which terminate alſo in ſtraight *ridges* that run along on each ſide the back of the *ſtone*; between which two *ridges*, there riſes a *third* more prominent one, juſt in place as it were of the *Spina dorſalis*, as in *Tab.* 5. *Fig.* 14. which though not wreathed, but plain like the other lower *ridges* on each hand it, I take to be the *Cornu Ammonis criſtatum* of *Johannes Bauhinus*[m]. One of theſe, of about four inches over, and made up of as many *turns*, was given me by the Reverend and Learned Dr. *John Wallis*; and there is another amongſt the Κειμήλια of the *Medicin School*, of above eight inches *diameter*, taken up as they ſay ſomwhere about *Corpus Chriſti College*.

94. There are alſo *Orphiomorphit*'s found ſomtimes about *Adderbury*, about two miles from *Banbury*, but ſo very ſeldom, that though I were there often, I could meet with none of them; ſo that I cannot inform the *Reader* whether they are of any peculiar kind, different from what have been already deſcrib'd, or no: However, that the Town has not its name from theſe ſtones (as Mr. *Ray* thinks) I dare confidently avouch, *Adderbury* being only the vulgar name: for in the *Court Rolls* of *New College*, (and o-other Inſtruments) to which the *Lordſhip* of the *Town* belongs, it is written *Eabberbury*, perhaps from St. *Ebba* the tutelar Saint of the *Church*.

95. The biggeſt of the kind that I have yet met with, was at

[1] *In t actatu de Canis Carchariæ diſſecto capite, p.* 118. [m] Johannes Bauhinus *de Lapidibus variis in fine Hiſt. admirabilis fontis,* Bollenſis *p.* 20.

Clifton

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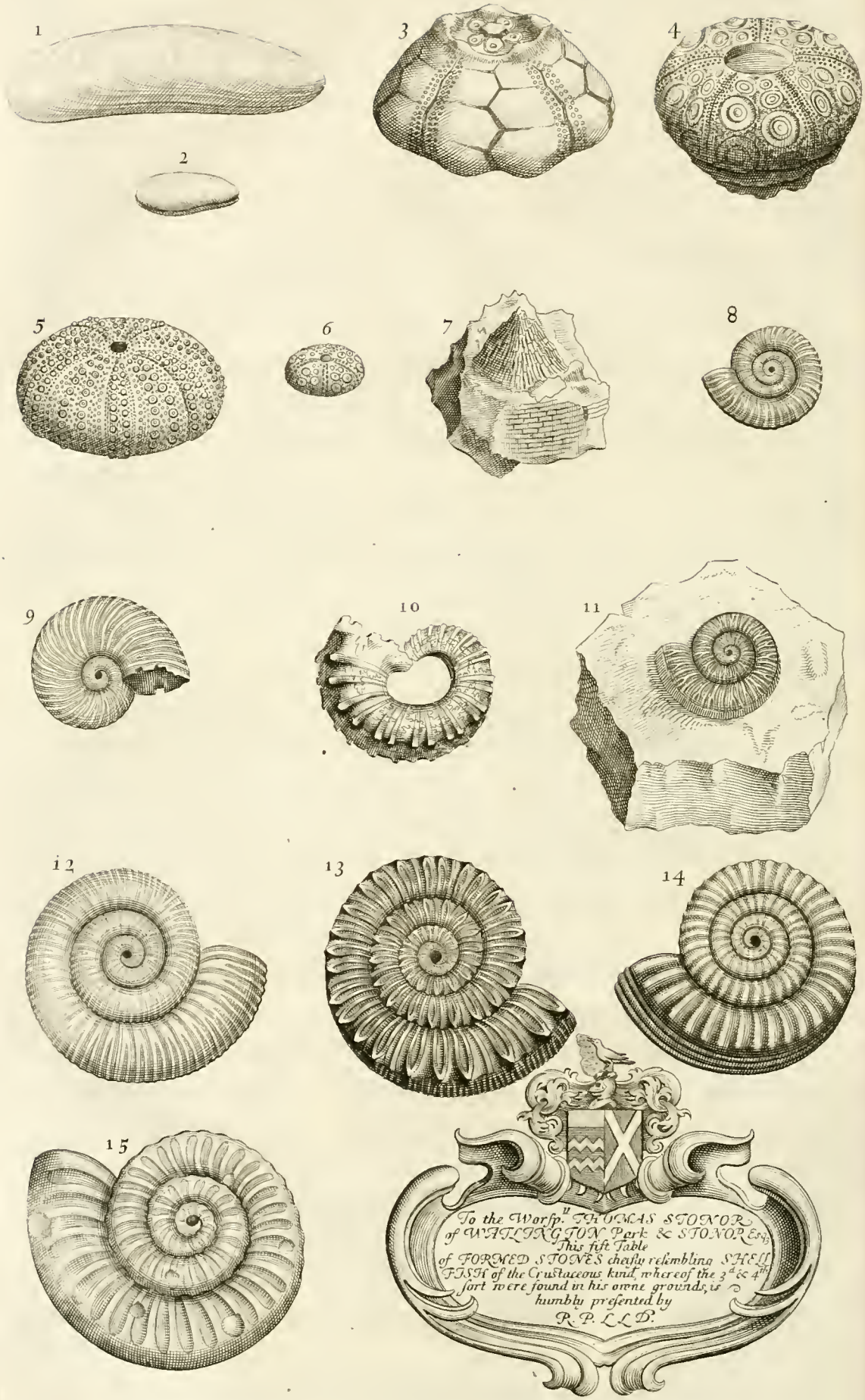
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To the Worsp.ll THOMAS STONOR
of WALLINGTON Park & STONOR Esq.
This fift Table
of FORMED STONES chefly relembling SHELL
FISH of the Crustaceous kind, whereof the 3d & 4th
sort were found in his owne grounds, is
humbly presented by
R. P. L. L. D.

Clifton near *Dorcheſter*, but found as I was told at *Sandford* near *Oxford*, about eleven inches over, and ſeventeen pounds in weight; having ſingle *ribs* only, without knobs or ridges at the back, which is plain and even, as in *Fig.* 15. which though little more than half ſo big as that mention'd by Dr. *Merret* of 21 inches *diameter* *, that he ſaw in the Garden of one Mr. *Rawdon*, yet I gueſs it muſt needs ſo extravagantly exceed the biggeſt *Nautilus* or *Porcellane-ſhell*, both in latitude and number of *turns*, that we muſt be forced to ſeek out another *origin* for it.

96. Beſide, its being in-laid with a ſmall ſort of *Conchites*, ſo placed in its ſides, that they have *ſegments* (if I may ſo call them) within the very bulk or body of the *Ophiomorphite*, ſeems flatly to deny its original from the *Nautilus*, for had this fallen out by compreſſion of their ſhells together, their uniform figures muſt needs have been ſpoiled, contrary to what appears as well in the *ſtone* as its draught. Which brings me to conſider the great *Queſtion* now ſo much controverted in the World.

> *Whether the ſtones we find in the forms of* Shell-fiſh, *be* Lapides ſui generis, *naturally produced by ſome extraordinary* plaſtic virtue *latent in the Earth or Quarries where they are found? Or whether they rather owe their form and figuration to the* ſhells *of the* Fiſhes *they repreſent, brought to the* places *where they are now found by a* Deluge, Earth-quake, *or ſome other ſuch means, and there being filled with* mud, clay, *and petrifying* juices, *have in tract of time been turned into* ſtones, *as we now find them, ſtill retaining the ſame ſhape in the whole, with the ſame* lineations, ſutures, eminencies, cavities, orifices, points, *that they had whil'ſt they were* ſhells?

97. In the handling whereof, though I intend not any peremptory *deciſion*, but a *friendly debate*; yet having according to the wiſhes and advice of thoſe Eminent *Virtuoſi*, Mr. *Hook* and Mr. *Ray*, made ſome conſiderable collections of theſe kind of *things*, and obſerved many particulars and circumſtances concerning them: Upon mature deliberation, I muſt confeſs I am inclined rather to the opinion of Mr. *Liſter*, that they are *Lapides*

* *Pinax rerum Naturalium*, p. 215. There is another about that bigneſs in the Repoſitory of the *Royal Society*, given by the Right Honorable *Henry* Earl of *Norwich*, Earl *Marſhal* of *England*.

ſui

ſui generis; than to theirs, *That they are thus formed in an Animal mold.* The *latter opinion* appearing at preſent to be preſſed with far more, and more inſuperable difficulties than the *former*.

98. For they that hold *theſe ſtones* were thus formed in the *ſhells* of *fiſhes*, muſt ſuppoſe either with *Steno* [n], that they were brought hither by the *Deluge* in the days of *Noah*; or by ſome other more particular, and perhaps *National* Flood, ſuch as the *Ogygean*, or *Deucalionian* in *Greece*, than either of which there is nothing more improbable.

99. Firſt, not by the Flood in the days of *Noah*, becauſe that (and for very good reaſons too) ſeems not to have been *univerſal*, and at moſt to have covered only the *continent* of *Aſia* [o], and not to have extended it ſelf to this then uninhabited *Weſtern* part of the World. But ſuppoſe it were *univerſal*, yet it proceeded from *Rain*, which (as Mr. *Ray* well obſerves) would more likely have carryed *ſhells* down into the *ſea*, than brought any upwards from it. And if it be further urged, *That the fountains of the great deep were broken up* [p], and that the *Deluge* proceeded partly from a *breaking forth* and over-flowing of the *ſea*, which conſequently might bring in the *ſhells*: It may be anſwered, that the over-flowing, either *gradually* increaſed upon the Earth, or was *violent*: if *gradually*, as it is moſt likely (for God cauſed not any *wind* to paſs over the *Earth* till the *Waters* began to aſſwage [q]; and beſides, the *Waters* that deſcended in *Rain*, in all probability at firſt ran down to the Sea, and gave ſome check to its *floods*) why ſhould we think that any *ſhell-fiſh*, eſpecially of the *teſtaceous* kind, whereof there are ſome that always ſtick to *rocks*, and others that have no locomotion, as *Oyſters*, *Muſcles*, *&c.* but what is given them by the *Waters* violence, ſhould leave their beds in the Sea at all, and be carried aloft to the tops of *Mountains*. And if *violent*, then ſuch a Flood would have indifferently ſcattered all ſorts of *ſhells* over the whole face of the *Earth*, eſpecially in all *valleys*; whereas we find the *ſtones* that reſemble them many times at the tops of *hills*, and but in few *valleys*; and thoſe not ſcattered neither indifferently one amongſt another, but for the moſt part thoſe of a *kind* together; and of the ſame *kind* too, thoſe of different *lineations* together. Thus at *Cornwell*

[n] *In Prodromo.* [o] *Vide* Stillingfleti *Origines Sacras, lib.* 3. *cap.* 4. [p] Gen. c. 7. ver. 11. [q] Gen. cap. 8. ver. 1.

and

and *Hornton* we find only *Conchites* or *Cockle-ſtones*, and thoſe *ſtriated* (if at all) from ſide to ſide *tranſverſly*, as in *Tab.* 4. *Fig.* 7, 8. And ſo at *Glympton* only *Cockle-ſtones*, but lineated the contrary way from the *commiſſure* to the *rim*, as in *Fig.* 6. of the ſame *Tab.* On *Cowley-common* we find nothing but *Oſtracites*, ſuch as in *Tab.* 4. *Fig.* 19. And in the Gravel-pits of St. *Clements* a mixture of ſuch *Oyſter-ſtones*, and (to which I believe it will be hard to adapt a *ſhell-fiſh*) the ſtone *Belemnites*. The *Nephiri* or *Lapis Megaricus* at *Langley*, is a bed of nothing but *Cockles* as ſmall as peaſe; and that at *Charlton* the ſame, only the *Cockles* are ſomwhat bigger. So that theſe beds of *Cockle-ſtones* (if they muſt needs have been *ſhell-fiſh*) ſeem rather to have been their breeding places, where they had aboad for ſome conſiderable time (eſpecially where we find them of ſeveral cizes) than brought hither in the *flood* in the time of *Noah*, which remained on the Earth but *forty natural days*, too ſmall a time for ſo many *ſhell-fiſh*, ſo diſperſed, as they muſt be preſumed to be by ſo violent a motion, to get together and ſequeſter themſelves from all other company, and ſet them down, *each ſort*, in a convenient ſtation.

100. And ſecondly, that they ſhould be brought by any other *flood* is altogether as unlikely, ſince we have no other *floods* deliver'd down to us, but the *Ogygian* and *Deucalionian*, which were reſtrained within *Greece*. But ſuppoſe all that can be deſired by the *adverſe* party, that there was ſomtime or other a *National flood* here in *England*, that did for ſome hundreds of years cover the face of the Land, of which there is no Record deliver'd to poſterity; yet that it ſhould cover the higheſt Hills, or if it did, that it ſhould force the *ſhells* to their tops, which are weighty and rather affect the loweſt places, is a conceſſion as hard to be granted, as that the Mountains (where ſuch ſtones as reſemble them are now found) were heretofore low places and ſince raiſed by *Earth-quakes*: a thing by no means to be believed of our *Northern* parts, where the *Earth-quakes* we have at any time are ſo inconſiderable, that they ſcarce ſomtimes are perceived, much leſs affrighten us; unleſs we ſhall groundleſly grant, that in the infancy of the *World* the *Earth* ſuffered more concuſſions, and conſequently more mutations in its *ſuperficies*, than it has done ever ſince the Records of time.

101. Yet granting too that in the *Primitive Times* there were ſuch ſtrange *Earthquakes*, or elſe that there was ſome time or other ſuch a *Flood*, that did cover our *higheſt hills*, and which might be ſo *violent*, as to bring *ſhells* out of the *great deep*, and place them on the *tops* of *Mountains*; yet that our *formed ſtones*, at leaſt the moſt of them, were not faſhion'd in ſuch *molds*, but are *Lapides ſui generis*, may be ſtrongly ſuſpected from the following *reaſons*.

102. Firſt, becauſe I have found ſome of them that reſemble *ſhell-fiſh* that always ſtick to *rocks*, and cannot well be preſumed to have come away with the greateſt *Flood*, unleſs ſo *violent* as to have brought the *Rocks* too: and ſuch is that *engraven Tab.* 5. *Fig.* 7. which whether it beſt repreſent the *Echinus quintus* of *Ariſtotle*, or ſome ſort of *Lepas* or *Patella*, equally makes for my purpoſe, neither of them leaving the *rock* they ſtick too, being *Univalves*, and having the *rock* it ſelf inſtead of the *other*.

103. Secondly, becauſe there are many *ſhells*, and other *teſtaceous* and *bony ſubſtances* belonging to *Fiſh*, that muſt alſo have been left behind upon the *ebb* of ſuch a *Flood* as well as the *reſt*, of which we have no ſtones that reſemble them at all. Such are the bones of *Whales*, *Sea-horſes*, and the bones of all the *ſquammeous* kind; the great *ſhells* of the *Buccina*, *Murices*, *Conchæ Veneris*, and *Solenes*; the ſword of the *Xiphias* or *Sword-fiſh*, and almoſt all the *cruſtaceous* kind, ſuch as *Crabs*, *Congers*, *Lobſters*, *&c.* which laſt having *locomotion*, I ſhould much rather expected to have found *petrified* on the tops of Mountains, than any of the *teſtaceous* kind, and yet of *theſe* we meet the feweſt of any.

104. Thirdly, becauſe there are many Stones formed indeed in the manner of *Bivalves*, *&c.* which yet reſemble no ſpecies of *ſhell-fiſh* now to be found, whereof ſeveral are above-mention'd. And this is ingeniouſly confeſs'd by *Fabius Columna*[r], though one of the Adverſaries of this my preſent *opinion*: *Addemus* (ſays he) Pectunculorum *imagines*, *quarum quaſdam non niſi* lapideas *vidimus*, of which that he calls his *Mytulo-pectunculus rarior Berberoides*, is one. If it be ſaid, that poſſibly theſe Species may be now loſt, I ſhall leave it to the *Reader* to judge, whether it be likely that *Providence* which took ſo much care to ſecure the *works* of the *Creation* in *Noah*'s *Flood*, ſhould either then, or

[r] *Aquatil. & Terreſtr. obſervat. cap.* 21.

ſince,

ſince, have been ſo unmindful of ſome *ſhell-fiſh* (and of no other *Animals*) as to ſuffer any one *ſpecies* to be loſt.

105. Fourthly, becauſe there are ſeveral *formed ſtones*, that no body pretends to know whether to refer, as repreſenting neither *Animals* or *Plants*, either in the whole or parts; ſuch as the *Selenites*, *Aſtroites*, and *Belemnites*; which if thus *tacitly* confeſt to be *Lapides ſui generis*, and formed by ſome latent *plaſtick power* of the *Earth*, why might it not as well produce all the *reſt*? eſpecially ſince ſcarce any of them are reduced to Animals or Plants without great inconvenience. Thus they that think the *Aſteriæ* to be nothing but the *Spinæ dorſales*, or tail-bones of *fiſh* petrified (they conſiſting, 'tis true, for the moſt part of pieces ſticking together like *Vertebræ*) neither can tell us of what ſort of *Fiſh*, nor give us any reaſonable account why the tail-bones of ſuch a particular *Fiſh* (for the *Aſteriæ* of all places are *ſtriated* alike, and ſeem to have had original from the ſame Species) ſhould be thus *petrified*, and not the tail-bones as well of ſome others?

106. And they that fanſie the ſeveral Species of *Brontiæ* to be nothing elſe but the *petrified ſhells* of *Echini Spatagi*, or *Briſſi*, would be hard put to it to reconcile the different conditions of that *ſhell-fiſh* and theſe ſtones: for firſt, the *Fiſh* it ſelf is but rarely found, πελαγιοι καὶ σπανιοι, ſays *Ariſtotle*[s], which is alſo confirmed by *Rondeletius*[t], whereas the Stones are plentiful enough. Again, the *Echinus Spatagus* has but few briſtles, *aculeis parvis & raris ſeptus*, ſays the ſame *Rondeletius*[u], and thoſe, if we may believe the Cuts of Authors, but diſorderly ſet; which how agrecable to our *Brontiæ*, *Tab.* 2. and 3. let any man judge. The firſt of them indeed in the groſs Figure, is like the *Heriſſons Spatagi* of *Boccone*[w] which he ſaw in *Holland*, flat like a *ſmall cake*; but he tells us nothing of ſuch numberleſs ſmall *annulets* as there are in our Stones, which if heretofore the places of ſo many *briſtles*, but ill agree with the deſcription of *Rondeletius*. Beſide theſe of *Oxford-ſhire*, there are ſeveral other ſorts that I have ſeen in other Counties (hereafter to be repreſented, in caſe this *Eſſay* prove acceptable) which I could heartily wiſh the Ingenious *Steno* and *Boccone*, or any other *Curioſo*'s, for the better clearing of this great *Controverſie*, would undertake to parallel (and ſo

[s] *Hiſt. Animalium, lib.* 4. *cap.* 5. [t] *De Piſcibus, lib.* 18. *cap.* 31. [u] *Loco citato.* [w] *Recherches & obſervations Naturelles Lettre* 26.

of other *formed ſtones*) with *ſhells* in all parts anſwerable.

107. They that think the *Cornua Ammonis*, or *Ophiomorphites*, to have been formerly nothing but *Porcellane-ſhells*, ſeem alſo to be preſſed with the like *difficulties*: for either there are ſeveral *ſorts* of them not known to (I am ſure not deſcribed by) Authors, or elſe our *ſtones* muſt have their *formation* from a different *mold* than their *ſhells*. For firſt, the *ſhells* ſeem to be extravagantly broad at the mouth, as deſcribed by *Rondeletius* and *Jonſton*, and not to have more than two other ſmall *turns* at moſt; whereas the *turns* of the *Ophiomorphit*'s are proportionable to one another, and in number many times four or five, and ſomtimes ſix, if we may believe *Aldrovandus*[x]: Of which difference *Chioccus*[y] ſeems to have been ſo well aware in his deſcription of the latter part of the *Muſæum Calceolarium*, that he makes the *Cornu Ammonis* and *Nautilus lapideus* to be quite different things, and deſcribes the *latter* very broad at the greater end, and with but one *turn*, ſomwhat like indeed to the *Porcellane-ſhell*.

108. Beſide, ſo far are ſome of our Engliſh *Ophiomorphit*'s from ever having been formed by the *ſhell* of the *Nautilus*, that at *Huntley-Nab* in the *North-riding* of *York-ſhire*, they are found always included in other great round *ſtones*, not unlike, ſays Mr. *Cambden*[z], to Cannon bullets. And at *Whitby*, ſays Mr. *Ray*[a], in ſtones of a *lenticular figure*, which if formerly they had been the *ſhells* of *Nautili*, how they ſhould become thus included in *ſtones* alſo of a *determinate figure*, is a difficulty more inſuperable than any of the former. Add hereunto that Mr. *Cambden*[b], and ſince him Dr. *Childrey*[c] plainly avouch, that the *Ophiomorphit*'s of *Cainſham*, have ſome of them *heads*, and that in *this* they differ from *thoſe* of *York-ſhire*: *Vidimus enim lapidem hinc delatum ſerpentis in ſpiram revoluti effigie, cujus caput in circumferentia prominuit, extrema cauda centrum occupante*, are the very words of Mr. *Cambden*. Which if I find true when I come into *Somerſet-ſhire*, will give *me*, and I doubt not, *others* ſatisfaction beyond all exception; for that the *ſhells* of the *Nautili* have any ſuch matter, no body yet has, nor will dare to pretend.

109. To which alſo add the *greatneſs* of ſome of theſe *ſtones*, whereof there are ſome it ſeems near two[d] foot in *diameter*, far

[x] *Muſæum Metallicum, lib. 4. cap. 1.* [y] *Muſæum Calceolarium, ſect. 3. p. 416.* [z] *Cambden* in *York-ſhire.* [a] *Topograph. Obſervat. p. 114.* [b] *Cambden* in *Somerſet-ſhire.* [c] *Britannia Baconica* in *Somerſet-ſhire.* [d] Dr. *Merret*'s *Pinax rerum natural. pag. 215.*

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exceeding, says Mr. *Ray* [e] the bulk of any *shell-fish* now living in our *seas*. To which if it be said that most *petrifications* are made either by *aggregation*, or by intrusion or protrusion of *parts*, which always increase the bulk of the *subject*: It may be answered, that though such *augmentation* must be allowed indeed in many cases, yet sure it did not so fall out in the *petrification* of the *Nephiri* or *Cockle-stone* at *Langley*, where the *stones* are much less than most Natural *shells*.

110. Fifthly, because that even those *stones*, which so exactly represent some sort of *shell-fish*, as *Oysters*, *Cockles*, *&c.* that there can be no exception upon the account of *figure*, but that they might formerly have been shells indeed; at some places are found with only *one shell*, and not the *other*. Thus in *Cowley-common* we meet only with the *gibbous*, and not the *flat* shell of the petrified *Oyster*, and so of the *Escallop-stones* in the Quarries near *Shot-over*; which had they been once the shells of *Oysters* and *Escallops*, in all probability had scarce been thus parted.

111. Sixthly, because I can by no means satisfie my self, how it should come to pass, that in case these stones had once been molded in shells, some of the same kind should be found in beds, as the *Conchites* at *Langley*, *Charleton*, *Adderbury*, and *others*, scatter'd as at *Glympton* and *Teynton*; and so the *Ostracites* at *Shot-over* and *Cowley*. Nor how it should fall out, that some of these *Bivalvulars* should always be found with their shells apart, as the *Ostracites* and *Pectines*: and *others* always closed together, as the *Conchites* in all places I have yet seen.

112. Lastly, because many of these *formed stones* seem now to be in *fieri*, as the *Selenites* at *Shot-over* and *Hampton-Gay*, the *Conchites* at *Glympton* and *Cornwell*, where within one of the *clay Cockles* above-mentioned, I found a little one of *stone*, not exceeding a *vetch* in bigness; which had they been formed heretofore by *Cockle-shells*, in all likelyhood would both either have been Stone or Clay. Nor can it be said they were brought hither by different *Floods*, because they were both found in the same *bed*, one included in the other. Which is all I have to urge for this part of the *Question*, but that in the *Bishoprick* of *Hildesheim*, between *Alfeld* and *Eimbec*, there is a sort of *Ochre* that forms it self in this manner into the *shape* of *Oysters* [f]: And that Mr. *Ray*

[e] Topograph. Observations, *p.* 127. [f] *Lachmundi* Ὀρυκτογραφ. *sect.* 1. *cap.* 4.

was

was informed by a perſon of good credit, of a *ſtone* of this nature reſembling a *Cockle-ſhell*, found in the belly of a *Beef*, where in all likelyhood it bred, and ſhot into that *figure*: Which if true, ſays he, there can be no reaſon to doubt, but that thoſe in the Quarries and other places are ſo generated.

113. But againſt this opinion there are ſeveral conſiderable *objections* brought by the ingenious Mr. *Hook*, *Steno* and *Boccone*, which I ſhall next faithfully propound to the beſt advantage, and then ſee whether they may not more eaſily be ſolved, than the *arguments* on the other ſide perhaps are like to be.

114. Firſt, That amongſt thoſe *ſtones*, there are ſome with the perfect *ſhell*, in figure, colour and ſubſtance, ſticking to their ſurface; eſpecially, ſays Mr. *Hook*[g], (diſcourſing of theſe matters) *thoſe* Serpentine *or* Helical ſtones *were covered with, or retained the ſhining or pearl-colour'd ſubſtance of the inſide of a* ſhell, *which ſubſtance on ſome parts of them was exceeding thin, and might be eaſily rubb'd off; on other parts it was pretty thick, and retained a white coat, or flaky ſubſtance on the top, juſt like the outſides of ſuch* ſhells; *ſome of them had very large pieces of the* ſhell, *very plainly ſticking on to them, which were eaſily broken or flaked off by degrees.* Add hereunto ſome particulars mention'd by *Steno*[h]. 1. *That there was found a Pearl-bearing ſhell in* Tuſcany, *a Pearl yet ſticking to the* ſhell. 2. *A piece of the great* Sea-nacre [pinna marina] *in which the ſilk-like ſubſtance within the* ſhell *being conſumed, the colour of that ſubſtance did remain in the earthy matter which had filled the* ſhell. 3. *That about the City of* Volaterra, *there are many beds of earth, not ſtony, which do abound with true* Cockle-ſhells, *that have ſuffer'd no change at all, and yet they muſt needs have lain there above* 3000 *years*; *whence it is evident, that that part of* Tuſcany *was of old time cover'd with the Sea*: And why then might not as well all thoſe other places where theſe petrified *ſhells* are found? 4. To which alſo let me add, that at ſome places here in *England*, particularly at *Cats-grove* near *Reading*, a place ſufficiently remote from the *Sea* (of which more at large when I come into *Berk-ſhire*) they meet with a bed of *Oyſter-ſhells* both flat and gibbous, about 12 or 14 foot under ground, not at all *petrified*, all of them opened, except ſome very few, that I ſuppoſe have ca-

[g] *Micrograph. Obſerv.* 17. [h] *In Prodromo.*

ſually

ſually fallen together; which how they ſhould come there without a *Deluge*, ſeems a difficulty to moſt men not eaſily avoided.

115. To all which it may be anſwered, firſt in general with Mr. *Liſter* [i], that we will eaſily believe that along the ſhoars of moſt Countries, ſuch as are particularly the ſhoars of the *Britiſh* and *Mediterranean Seas*, there may all manner of *Sea-ſhells* be found promiſcuouſly included in Rocks or Earth, and at good diſtances from the Sea, where the grounds are no higher than the *Volaterran hillock*, which meeting with ſuitable *petrifying juices*, may either be wholly *petrified*, or where the juices are not competent, be only *metamorphoſ'd* in part, ſome of the *ſhelly* ſubſtance ſtill remaining; or not changed at all, as in the inſtances of *Steno*, and perhaps of Mr. *Hook*, for he tells us not where he found thoſe *ſemipetrified ſtones*.

116. But ſecondly, Suppoſe he found them in the higheſt and moſt In-land Counties, ſince he tells us not that he found them in any great plenty, we can eaſily alſo admit that ſome ſmall quantities of *ſhells* thrown away after the Inhabitants had eaten the *fiſh*, may even there be filled with mud and petrifying juices, and ſo turned either in the whole or part into *ſtone*.

117. And thirdly, provided it be near a great *Town* or *City*, either now flouriſhing, or that did ſo heretofore, and hath formerly been the ſeat of much *action*; it may be allowed alſo that ſome quantities of *ſhells* may be found, either perfectly or but imperfectly *petrified*, or that have ſuffer'd no change at all: which helps me to a *ſalvo* for my own Objection taken from the bed of true *Oyſter-ſhells* found near *Reading*, it having been a *Town* of very great *action* during the Invaſions of the *Danes*, who cutting a deep trench croſs between the *Kennet* and *Thames*, and incloſing themſelves as it were in an *Iſland*, held it againſt King *Ethelred*, and *Alfred* his Brother [k] a conſiderable time; from whence, in all probability, the *Saxons* having removed their Cattle and other proviſions before the *Danes* arrival, 'tis likely that they might be ſupplyed from their *Navy* with *Oyſters*, which during the time of the aboad of the *Army* on Land, might be a very ſuitable employment for it: Which conjecture, if allowed, there is nothing more

[i] *Philoſoph. Tranſact. Num.* 76. [k] *Vid. Hen. Huntingdon, lib.* 5. *& Aſſerium Menevon. de rebus geſtis Ælfredi.*

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required to make out the possibility of the bed of *Oysters* coming thither without a *Deluge*, but that *Cats-grove* was the place appointed for the *Armies* repast.

118. Secondly, That these *formed stones* are many of them in all respects like the living *shell-fish*; thus says *Boccone*, the *Herissons Spatagi* of *stone* [l], the *Cornua Ammonis* or *Nautili lapides* [m], have the very marks, characters, eminencies, cavities, and all other parts alike, with the true living *Nautili*, and *Herissons spatagi*, and *Brissi* of *Imperato*, and *Rondelet*, which proves, says he, *the body changed to have been the very same thing, with that which is living*. But I must tell him, it do's it but very weakly, all arguments drawn a *similitudine* being the most inefficacious of all others, such rather illustrating than proving, rather perswading than compelling an *adversaries* assent: For how many hundred things are there in the *World*, that have some resemblance of one another, which no body will offer to think were ever the *same*, and particularly amongst some other *formed stones* hereafter to be mentioned. Such are the *stones Otites*, or *Auriculares*, several sorts of *Cardites*, *Lapides Mammillares*, *Hysterolithos*, *&c.* which though they as exactly resemble those parts of *Men* from whence they have their *names*, as any *Conchites* or *Echinites* do those *shell-fish*; yet no *Man* that I ever heard of, so much as dreamed that these were ever the real parts of *Men*, in process of time thus turned into *Stone*. As well might we say, that our *Kettering-stone* in *Northampton-shire* here in *England*, was once nothing else but the spawn of *Lobsters*; than which, that I know of, there is nothing more like.

119. But should it be granted that these stone *Herissons spatagi* were somtime *real shell-fish*, as reasonably enough perhaps we may, they being found at *Malta*, as you come into the *Port* over-against St. *Erme* [n], yet this by no means would conclude that all others of the *form* must needs be so, that are attended with much different, and indeed (in respect of having once been *shells*) inexplicable circumstances.

120. Thirdly and lastly, *That it seems quite contrary to the infinite* prudence *of* Nature, *which is observable in all its works and productions, to design every* thing *to a determinate* end, *and for the attaining that* end, *makes use of such ways as are (as far as the know-*

[l] *Reckerches & observat. Naturelles, Lettre 26.* [m] *Libro citato, Lettre 28.* [n] *Libro citato, Lettre 26.*

ledge

ledge of man *has yet been able to reach*) *altogether conſonant and agreeable to* mans *reaſon, and of no way or means that doth contradict, or is contrary to* human ratiocination: *Whence it has been a general obſervation and* Maxim, *that* Nature doth nothing in vain. *It ſeems I ſay contrary to that great wiſdom of* Nature, *that theſe pretily ſhaped bodies ſhould have all thoſe curious figures and contrivances* (*which many of them are adorned and contrived with*) *generated or wrought by a* plaſtic virtue, *for no higher end than only to exhibit a* form °.

121. To which I anſwer, that Nature herein acts neither contrary to her own *prudence, human ratiocination*, or in *vain*, it being the wiſdom and goodneſs of the *Supreme Nature*, by the *School-men* called *Naturans*, that governs and directs the *Natura naturata* here below, to beautifie the World with theſe varieties; which I take to be the end of ſuch productions as well as of moſt *Flowers*, ſuch as *Tulips*, *Anemones*, *&c.* of which we know as little uſe as of *formed ſtones*. Nay, perhaps there may proportionably, number for number, be as many of *them* of *Medicinal* or other *uſe*, ſuch as *Selenites*, *Belemnites*, *Conchites*, *Lapis Judaicus*, *&c.* as there are of *Plants*: So that unleſs we may ſay alſo (which I gueſs no body will) that theſe are produced contrary to the great wiſdom of Nature, we muſt not of *ſtones*.

122. And thus I have given the grounds of my preſent *opinion*, which has not been taken up out of *humor* or *contradiction*, with intent only to affront other worthy Authors modeſt conjectures, but rather friendly to *excite them*, or any *others*, to endeavor collections of *ſhell-fiſh*, and parts of other *Animals*, that may anſwer ſuch *formed ſtones* as are here already, or may hereafter be produced: Which when ever I find done, and the *reaſons* alleged *ſolidly* anſwered, I ſhall be ready with acknowledgment to retract my *opinion*, which I am not ſo in love with, but for the ſake of *Truth* I can chearfully caſt off without the leaſt reluctancy.

123. However, in the mean time ſince no doubt it will be expected, upon ſo deliberate rejection of *Animal molds*, that ſome further and more particular account ſhould be given of the *Plaſtic virtue*, or whatever elſe it is, that effects theſe *ſhapes*: I ſhall briefly ſet down alſo my preſent thoughts concerning it, which yet I intend not *my ſelf* (much leſs deſire the *Reader*) to em-

° Mr. *Hooks* Micrographia, Obſerv. 17.

brace, any further then I ſhall find them agreeable to future experience.

124. That *Salts* are the principal Ingredients of *ſtones*, I think has ſo ſufficiently been noted already, that to endeavor any further evidence of the *thing*, would be *actum agere* in me, and loſs of time to the *Reader* : And if of *ſtones* in general, much rather ſure of *formed ones*, it being the undoubted prerogative of the *Saline Principle* to give Bodies their *figure*, as well as *ſolidity* and *duration* : No other principle that we yet know of naturally ſhooting into *figures*, each peculiar to their own kind, but *ſalts* ; thus *Nitre* always shoots into *Pyramids*, *ſalt Marine* into *Cubes*, *Alum* into *octo*, and *Sal Armoniac* into *Hexaedrums*, and other mixt *ſalts* into as mixt *figures*.

125. Of theſe ſpontaneous inclinations of *ſalts*, each peculiar to its *kind*, we have further evidence in the *Chymical* Anatomy of *Animals*, particularly in the *volatile ſalt* of *Harts-horn*, which in the beginning of its aſcent is always ſeen branched in the head of the *Cucurbit* like the natural *Horn*. And we were told the laſt *Term* by our very Ingenious and Learned *Sidleyan Profeſſor* * here in *Oxon*, That the *ſalt* of *Vipers* aſcends in like manner, and shoots into *ſhapes* ſomwhat like thoſe *Animals*, placed orderly in the *glaſs*. Thus in *congelations* which are all wrought by adventitious *ſalts*, we frequently find curious *ramifications*, as on Glaſs-windows in winter, and the figur'd flakes of *ſnow* ; of which Mr. *Hook* [P] obſerved above an hundred ſeveral ſorts, yet all of them branched as we paint *ſtars*, with ſix principal *Radii* of equal length, shape, and make, iſſuing from a *center* where they are all joined in *angles* of 60 *degrees*.

126. What *ſalt* it ſhould be that gives this *figure*, though it be hard to determin, yet certainly it muſt not be a much different *one* from *that* which gives form to our *Aſtroites* and *Aſteriæ*, whereof, though the latter have but five *points*, and therefore making *angles* where they are joyned at the *center* of 72 *degrees* ; yet the *Aſtroites* both in *mezzo Rilievo* and *Intagli*, as in *Tab.* 2. have *many* more. Perhaps there may be ſomthing of an *Antimonial ſalt* that may determin Bodies to this *ſtarry* figure, as no queſtion it do's in the *Regulus*, and the *Caput mortuum* of the *Cinnabar* of *Antimony*. To ſuch a *ſalt* may alſo be referr'd our *Brontiæ* or *Om-*

* Dr. *Thomas Millington* Fellow of *All Souls* Coll. [P] Mr. *Hooks* Micrograph. Obſerv. 14. Schem. 8.

briæ,

briæ, and all the *Echinites*, *some* whereof are plainly, *all* in some measure *stellated* at the top.

127. The *Belemnites* which are all *striated* from a *center*, yet in the whole affect a *pyramidal* form; seem to have somwhat also of an *Antimonial*, but a more prevalent quantity of a *nitrous salt*.

128. The *Conchites*, *Pectinites*, and *Ostracites*, whether transversly *striated*, or from the *commissures* to the *rim*, seem to own their origin to *urinous salts*, which shoot likewise from a *center* (as suppose from the hinges of these *stones*) but generally are most extended to one side, as may be seen in the branched figure formed on the surface of *urine* by freezing, in Mr. *Hooks Micrography*[q]; whose *striæ* not obtaining much above the *quadrant* of a *circle*; whatever other difference there may be, in this respect at least is agreeable to our *Stones*.

129. To which add the *Ophiomorphit*'s, or *Cornua Ammonis*, most probably formed either by two *salts* shooting different ways, which by thwarting one another make a *helical* figure, just as two opposite winds or waters make a *Turbo*; or else by some simple, yet unknown *salt*, that affects such a figure: perhaps the stems and branchings bended in a most excellent and regular order, like the ribs of some of our *Ophiomorphit*'s, observed by Mr. *Hook*[*] in *Regulus Martis Stellatus*, might not a little conduce to the clearing this matter.

130. How near I am to the mark in these former Conjectures, I dare not too temerariously resolve: But as to the formation of the *Rhomboideal Selenites*, *Tab.* 2. *Fig.* 1. with a little more confidence I shall venture to pronounce it, to come from a *Tartareous salt* in the Earth; having observed in the Honorable Mr. *Boyl*'s way of preparing *Tartarized* Spirit of Wine[r], that the *Calx* of *Tartar* being fated with the *phlegmatick* part of the *Spirit*, and dissolved by the heat; set to cool, somtimes shoots (I dare not say always) exactly into such *Rhomboideal* figures made up of *plates*, and the whole *Rhomboids* somtimes issuing out of one another, just as we find the *Selenites* often do.

131. More might have been added concerning some other *formed stones* hereafter to be mention'd; but I have now only time to hint my *Hypothesis*, which I suppose may be sufficiently done

[q] *Ibidem.* [*] *Micrographia observ.* 14. [r] Essay 1. of the unsuccessfulness of Experiments.

in the afore-going inſtances; not intending to proſecute it further till I have had more experience, which this my preſent attempt ſerves to shew the World is yet but ſmall. And therefore I haſten on to the reſidue of the *formed ſtones*, which according to my *method* laid down in the beginning of this *Chapter* (having done with all ſuch as relate to the *waters*) are thoſe that reſemble any *terreſtrial bodies*; and amongſt them, firſt of ſuch as belong to the *vegetable* Kingdom.

132. Whereof there are ſome that repreſent whole *Plants*, and ſuch is the *Fungites* or *Tuberoides*, found ſomwhere in the *Chiltern* about *Stoken-Church-hill*, and engraven *Tab.* 6. *Fig.* 1. of a *cinereous* colour without, but a *black Flint* within, and lively repreſenting one of the *fungi lethales non eſculenti*.

133. *Others* there are that reſemble only the parts of *Plants*, and ſuch is that depicted *Tab.* 6. *Fig.* 2. like a *Bryony-root* broken off tranſverſly, and ſhewing the *fibrillæ* from the *center* to the *circumference*, with the other *ſtriæ* deſcending down the *ſides*, and the *annulary diviſions*; and all *theſe* in a *ſtone* ſo exactly of the colour of a *Bryony-root*, that it would be hard to diſtinguiſh it, were it not for the *weight*. This was found in the Quarry-pits of rubble ſtone near *Shot-over* hill.

134. And others there are again like the *Fruits* of *Trees*, as in *Tab.* 6. *Fig.* 3, and 4. which in general may be called *Lapides pyriformes*, whereof the firſt is a *black flint* found ſomwhere near *Bix brand*, above eleven inches round, and in bigneſs and form reſembling the *Bell* or *King-pear*: The other a ſort of *Pebble*, whitiſh without, and yellow within (as manifeſtly appears at the place of the *ſtrig*) in the ſhape of a *Warden-pear*, found in the Parish of *Waterſtock*, by the Learned and Ingenious Sir *George Croke*, ſomwhere near his houſe.

135. In the Parish of *Whitchurch* not far from *Hardwick*-houſe, I found a hard ſtone in the form of an *Apricock*, with the *Rimula* or cleft from the *pedicle* to the *apex*, juſt as in the true *plum*, and as depicted *Tab.* 6. *Fig.* 5. And in the Quarries of rubble ſtone near *Shotover*-hill, I met with a kind of *ſpar*, ſhot exactly into *protuberances* (and in the whole bulk) like a *Mulberry*, as in *Fig.* 6.

136. On the *Chiltern*-hills near to *Sherbourn*, I found a white Flint, with another ſet in it, in the form of a *Luca* Olive, as in *Fig.* 7.

Fig. 7. To which may be added, the *Lapides Judaici* of *Oxford-ſhire*, which though of a much more ſlender and longer figure than any ſort of *Olive*, yet becauſe in other Countries they are found in that ſhape, and for that very reaſon called ſomtimes *Pyrenes*, and treated on by *Authors* [s] amongſt *ſtones* relating to the *fruits* of *Trees*, I ſhall not change their place. We find them here of different cizes, from about two inches in length and an inch and half in circuit, downwards to an inch and leſs in length, and not much above half an inch round: Moſt of them have a kind of *pedicle*, from which they ſeem to have had their growth, and are *ridged* and *channelled* the whole length of the *ſtone*, the *ridges* being *purled* with ſmall knots, ſet in the *Quincunx* order, as in *Tab.* 6. *Fig.* 8. As to their *texture*, I find it to be very curious, made up of *Lamellæ* or little thin *plates*, not unlike the *ſtone Selenites*; only theſe are *opaque*, and the whole bulk of the *ſtone* indeed much different. The *Plates*, as in the *Selenites*, ſeem to be made up of *ſtrings*, which in moſt of them run *three*, but in ſome but *two* ways; according to the running of theſe *ſtrings* the *ſtones* will eaſily cleave, but generally ſome one way rather than any other, which moſt commonly is agreeable to the *helical* running of the *ridges* of knots or furrows between them, yet all ways obliquely to the *Axis* of the ſtone, as is perfectly ſhewn, *Tab.* 6. *Fig.* 9. which repreſents the *ſtone* broken the three ſeveral ways.

137. By *Authors* they are ſaid to be of different *Sexes*, the leſſer and rounder of the *feminine*, and the greater and longer of the *maſculine* gender; whereof the former is good againſt the *ſtone* in the *bladder*, and the latter againſt it in the *kidneys*, for which reaſons they are ſomtimes by *Authors* called *Eurrhei*, and *Tecolithi*. The greater and longer, ſays *Geſner* [t] are rarely found, but that muſt be reſtrained to his *own* Country; for here in *Oxford-ſhire*, and particularly in the Quarries of rubble ſtone near *Shotover*-hill, we have plenty of them.

138. There is another ſort of *them* alſo at the ſame place, much more ſlender than the reſt, plain and ſmooth, without either *ridges* or *channels*, mention'd by *Cæſalpinus* [u]; which (and not the *Lapis Judaicus*) by *him* is ſaid to be the true *Tecolithus* of

[s] Geſner *de Figuris Lapidum, cap.* 9. [t] *Idem loco citato.* [u] Andreas Cæſalpinus *de Metallicis, lib.* 2. *cap.* 44.

Pliny [w],

Pliny[w], that breaks and expels the *ſtone*, if the *Patient* do but lick it. Of colour without, it is a whitiſh yellow, and breaks into ſhining white *plates* obliquely to the *axis* of the *ſtone*, like the former, but whether made up of *threds* running differing ways, I could not afford to try, having but one of the kind; which was found and given me, beſide ſeveral other matters of the ſame nature, by my very good Friend *Edward Tyſon A. M.* an ingenious and induſtrious ſearcher into the works of *Nature* and *Arts*.

139. Hither alſo muſt be referr'd the freſh water *Adarce* made at the *Caſcade* at *Sommerton*, which though but a meer *incruſtation*, and formed not of it ſelf, but *ad formam alterius*, *viz.* of the *graſs* about which it gathers, and therefore none of the *Lithophyta*; yet it having ſome *form*, though but *accidental*, I have thought rather fit to miſplace it here, than omit to ſhew the Reader how prettily the *graſs* is ſheathed with *ſtone*, which is accuratly expreſſed by *Fig.* 10.

140. Thus having done with the *Lapides φυτοειδεῖς*, I proceed to the *ſtones* reſembling *Animals*, either in the whole or parts; amongſt which, ſome there are that ſeem to have been *reptils* petrified, which poſſibly enough coming to the places where they are now found in *ſtone* without the difficulties of a *flood*, may be true enough too: though I know ſome places in other *Counties*, where there are *Cochleomorphit*'s or *ſnail-ſtones* ſo thick, that they ſeem unlikely to have ever been the *ſpoils* of that *Animal*. In *Oxford-ſhire* indeed I have met with but two, one at *Teynton*, and another in the rubble Quarries near *Shotover*-hill, both which being of the ſame *ſhape*, colour and bigneſs, are repreſented together under *Fig.* 11.

141. At the ſame rubble Quarries we find alſo the *Lapides vermiculares*, or *worm-ſtones* of two ſorts, whereof one is of a whitiſh yellow colour, not hollow within, and as far as I could perceive of the ſame texture with the rubble *ſtone* it ſelf; ſome of them are of the bigneſs of a ſmall quill, and lie in the rock in *mezzo rilievo* irregularly contorted, much after the manner of the *Vermicchiara*, or *Alcyonio Mileſio* of *Ferrante Imperato* *, as in *Tab.* 6. *Fig.* 13. whereas the other ſort lies in the very body of the *ſtone*, of a white colour, and regularly curled up like the

[w] *Nat. Hiſt. lib.* 37. *cap.* 10. * *Dell' Hiſt. Naturale, lib.* 27. *cap.* 8.

ſpring

ad pag. 126.

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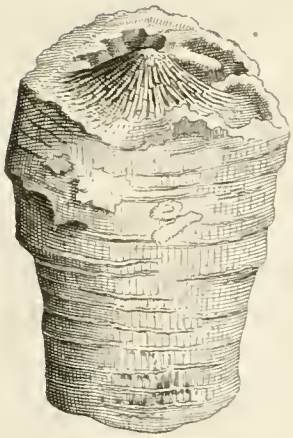
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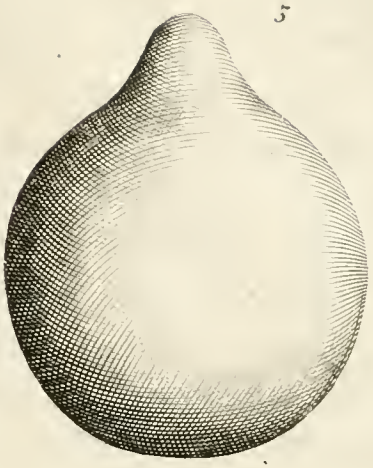
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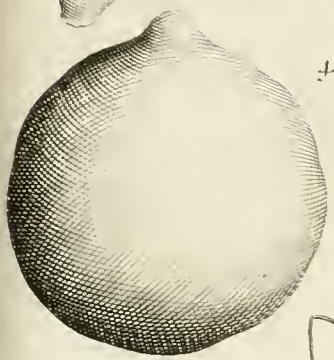
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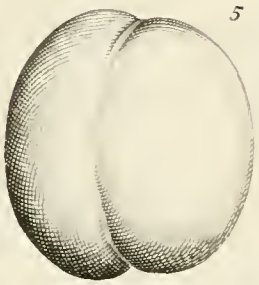
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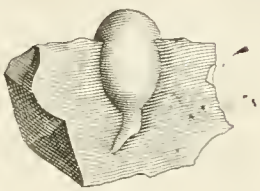
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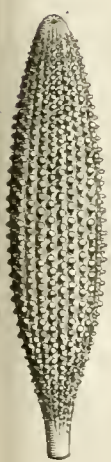
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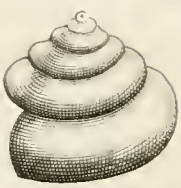
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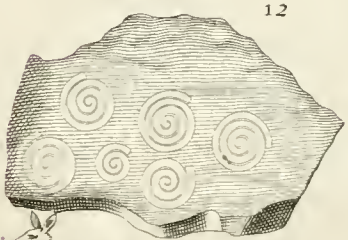
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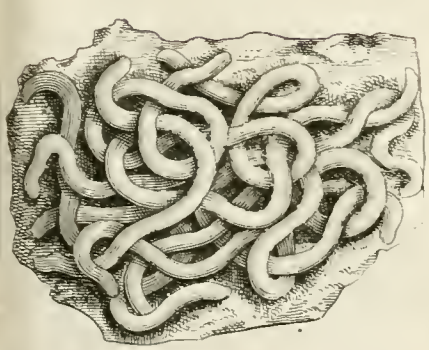
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ſpring of a *Watch*, as in *Fig.* 12.

142. After thoſe that concern *Reptils*, come we next to formed ſtones that reſemble the parts of *four footed beaſts*, whereof we meet with one ſort in the Quarries at *Heddington*, ſet in the body of the *ſtone*, the moſt like to the head of a Horſe of any thing I can think of; having the *ears*, and *creſt* of the *mane* appearing between them, the places of the *eyes* ſuitably *prominent*, and the reſt of the *face* entire, only the *mouth* and *noſtrils* are abſent in them all, as in *Tab.* 7. *Fig.* 1. Theſe are plentifully enough found, and of divers cizes, yet not mention'd that I know of by any *Author*, wherefore I have taken the boldneſs to fit them with a name, and in imitation of other *Authors* (in the like caſe) ſhall call them *Hippocephaloides*.

143. At *Heddington* in the ſame Quarry there are plenty of *Cardites*, or *ſtones* in the forms of *hearts*, but by *Authors*, becauſe of their bigneſs, generally called *Bucardites*, or ſtones like *Bulls hearts*. Theſe at *Heddington* are all of them of a whitiſh yellow colour, ſmooth and plain, as in *Tab.* 7. *Fig.* 2. but there are others found about *Briſe-Norton* and *Witney*, that ſeem to be ribbed on each ſide, as in *Fig.* 3. Of theſe I had one ſent me by my worthy Friend *Robert Perrot* Eſq; from *North-Leigh*, ten inches round, and near two pounds in weight, which is the biggeſt of the kind that I ever yet ſaw, except one that I found at *Shetford*, going up a little hill eaſt-ward of the *town*, about 20 pounds in weight, though broken half away, curiouſly reticulated with a white-ſpar-colour'd *ſtone*, as in *Tab.* 7. *Fig.* 4. which being much too heavy for my Horſe-portage, was afterward upon my direction, fetch'd away by that miracle of Ingenuity Sir *Anthony Cope*, ſince whoſe deceaſe it is come I ſuppoſe into the hands of his equally ingenious Brother Sir *John Cope*, the Heir of his Virtues as well as Eſtate.

144. To theſe add the *Orchites*, or *Lapides teſticulares*, that lie at the foot of *Shotover*-hill, which though indeed they extravagantly exceed thoſe parts as well of *beaſts* as *men*, yet of the two I rather thought fit to place them here: Moſt of them lie in pairs coupled together, as in Tab. 7. Fig. 6. and are called *Diorchites*; but ſomtimes (as it alſo falls out in monſtrous *Animals*) there are three of them found together, and then we call them *Triorchites*, whereof there are two or three on the foot of the ſame Hill of ſo

vaſt

vaſt a bigneſs, that I gueſs they cannot be leſs than a *tun* in weight: I am ſure that which lies higheſt on the Hill, and is here repreſented *Fig.* 5. is ſo much at the leaſt. Of theſe all that Weſtern ſide of the Hill ſeems to be compoſed, if one may gueſs by their appearance above the ground on each hand the way; but how they ſhould come there, or with what *Animal*-mold formed (if not by ſome peculiar *plaſtic* power in the *earth*) I leave to the favorers of that opinion to find.

145. Hither alſo I muſt refer for the very ſame reaſon, a ſort of ſtone found in the Quarries of rubble ſtone near *Shotover*, compoſed as it were of *filaments* like *hair*, which yet muſt not be the *Polythrix* of *Pliny*[x] becauſe not greeniſh, nor the *Boſtrychites* of *Zoroaſtres*, or the *Corſoides* of the ſame *Pliny*[y], becauſe neither gray nor long. However, let it be a *Thrichites* (though the word be differently uſed by *Dioſcorides*[z]) and the rather placed here, becauſe moſt like the ſhort hair of *beaſts*: Of colour it is yellowiſh, and each hair (as they appear in the *Microſcope*) ſeems to be *ſtriated* and *channelled* its whole length; but to the naked eye they ſhew themſelves only in *columns*, which at certain diſtances are all jointed, as in *Fig.* 7.

146. Beſide the *ſtones* repreſenting the parts of the *Viviparous*, I have met with one that ſeems to belong to the *oviparous Quadrupedes*, and that is a *Bufonites* or *Toad-ſtone*, which perhaps may better deſerve its name, than any yet mention'd by other *Authors*. For by my *Bufonites* or *Toad-ſtone*, I intend not that ſhining poliſh'd *ſtone*, firſt demonſtrated by the Ingenious and Learned Dr. *Merret*, in His *Majeſties* preſence, to be nothing elſe but the jaw-tooth or grinder of the *Lupus marinus*, and ſo confeſt to be by the *Gold-ſmiths* that ſold them. But a certain reddiſh liver-colour'd real *ſtone*, indeed of the form of thoſe of the *Shark-fiſh*, *i. e.* like the *ſegment* of a *ſphere*, convex at the top, and concave underneath, as in *Tab.* 7. *Fig.* 8. but found amongſt the Gravel in *Magdalen Coll.* Walks: and may be ſo called (as I preſume the others are) from ſome reſemblance they have to the figure of a *Toads skull*, not that there comes any ſuch thing out of a *vexed toads* head, as is commonly and no leſs fabulouſly reported.

147. The *ſtones* that reſemble the parts of *Men* being next to be conſider'd, I ſhall begin with thoſe that have relation to the

[x] *Nat. Hiſt. lib.* 37. *cap.* 10. [y] *Idem loco citato.* [z] *Lib.* 5 *cap.* 114.

head.

head, and ſo deſcend in order to the lower *parts*: According to which *method*, the firſt that preſents it ſelf is one of the *Brontiæ*, whoſe upper part was deſcribed before, *ſect.* 33. of this *Chapter*, where I had alſo ſhewn its *baſis*, but that it ſomwhat reſembles part of the ἐγκέφαλον, or *baſis* of a *Mans* brain, yet included within its *dura Meninx*, with the ſeveral *pairs* of *nerves* cut aſunder as they come through it, according as the *brain* is prepared and inverted in Dr. *Willis*'s new way of diſſecting it: Beſide the *exit* of the *proceſſus Mammillares*, and ſeveral *pairs* of *nerves*, it has a fair reſemblance of the *Cerebellum* at *a a*, and of the *Medulla oblongata* at *b b*, as is plainly repreſented in *Tab.* 7. *Fig.* 9. This was found, as above-ſaid, in the *Chiltern Country*, and much better deſerves the name of *Encephaloides*, than any deſcribed by *Aldrovandus*[b], or others.

148. Add hereunto another ſort of *ſtone*, found in the rubble Quarry near *Shotover*-hill, lively repreſenting the *Olfactory nerves* or *par primum*, entire and whole, and not cut off. Of theſe there are many to be found in theſe *pits* of a yellowiſh colour, ſmooth without, and I think all of them (for I have broke ſeveral) hollow within, as in *Tab.* 7. *Fig.* 10.

149. I have alſo a *ſtone* (not unlike a *pebble*) found ſomwhere in the gravel near the *City* of *Oxford*, of an oval figure, and for the greateſt part of a reddiſh colour; but at one end diſtinguiſh'd, firſt with a circle of white, within which is a *Zone* of the proper colour of the *ſtone*, and then a round *pupilla* of white, in the whole reſembling the figure of an *Eye* obſcured by a *Cataract*, as in *Tab.* 7. *Fig.* 11. This I ſhould have taken for the ſtone called *Beli Oculus*, but that *Boetius*[c] expreſly makes the body of that to be of a white colour: The neareſt it comes to any yet deſcribed, is the *Leucophthalmus* of *Pliny*, which he plainly ſays is of a reddiſh colour, in which yet it carryeth the form of an *Eye* both for white and black[d]: And ſo do's ours, only it wants the black *Pupilla*, which we muſt ſuppoſe to be covered by a *Cataract*. However, it may paſs for an *Ophthalmites*, or ſome ſort of *Eye-ſtone*: whence I proceed to ſome others, in ſhape alſo of another of our *ſenſes Organs*.

[b] *Muſæum Metallicum, lib.* 4. *c.* 1. *pag.* 477. [c] *Boetius de Boot, de lapid. & gem. lib.* 2. *c.* 99. [d] *Nat. Hiſt. lib.* 37. *cap.* 10. [d] *Vid. Eraſmi Colloquium cui Tit. Peregrinatio Religionis ergo.*

150. Which by reaſon they ſo well reſemble the *Ears* of a *Man*, though much leſs, as in *Tab.* 7. *Fig.* 12. I have made bold to call them *Otites*, or *Auriculares*: Of which we have plenty in the rubble Quarries near *Shotover*, in the banks of the High-ways North of *Fulbrook* Church; but the moſt I ſaw any where yet, are in a bank near a *ſpring* riſing at *Sommerton* Towns end, Eaſtward from the *Church*, in the *Lordſhip* of the Worſhipful *Richard Fermor* Eſq; whoſe many ingenious Contrivances about his Houſe, beſide other aſſiſtances he readily afforded me, have eminently contributed to this *Hiſtory*, as will more abundantly appear in the *Chapter of Arts*.

151. From the *Upper*, I deſcend next to ſuch *formed ſtones* as reſemble any of the parts of the middle *Ventricle*, or *Thorax*: whereof I met with ſome on *Stoken-Church* Hill, of a Flinty ſubſtance, ſtrangely like to *human Paps*, or *Duggs*; having not only the *Mamma*, but *Papilla* too, ſurrounded by an *Areola*, and ſtudded with ſmall protuberances, as in *Tab.* 7, *Fig. ult.* and therefore well deſerving the name of *Mammillares*: than which yet I had once a much better pattern, unhappily loſt in the portage, betwixt my *Chamber* and the *Gravers*.

152. And if we look further into the *inner parts*, I have a *ſtone* that ſo exquiſitely repreſents the *Heart* of a *Man*, as in *Tab.* 8. *Fig.* 1. that at, and near the *baſis*, there remains the trunck of the deſcending part of the *Vena Cava* at *a*, the aſcending portion of the *Vena Cava* at *b*; and from the left *Ventricle* the trunck of the *Arteria magna*, tending upwards at *c*, and a portion of the ſame *Artery* tending downwards at *d*. This was alſo found on the Hills near *Stoken-Church*, being a whitiſh kind of *Flint*, and perhaps may merit the name of *Anthropocardites*. Whereunto add another found in the Gravel near *Oxford*, by my ingenious Friend *John Baniſter* M. A. of *Magdalen College*, which though not ſo exactly of the ſhape of a *Heart* as the *former*, yet becauſe *ſtellated* all over from the *baſis* to the *mucro*, as in *Fig.* 2. I thought its admittance would not be ungrateful to the *Reader*.

153. Other *ſtones* there are alſo in likeneſs of ſome parts of the *Abdomen* or *loweſt Ventricle*; ſuch are the *ſtones*, *Didymoides*, found in the Quarries of rubble ſtone near *Shotover*-hill, having upon it both the *rugoſity*, and *ſuture* of the *Scrotum*, And *Phalloides*, which I met with near the *Wind-mill* at *Nettlebed*, perfectly repreſenting

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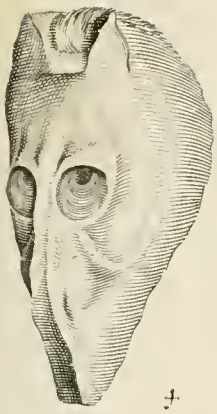

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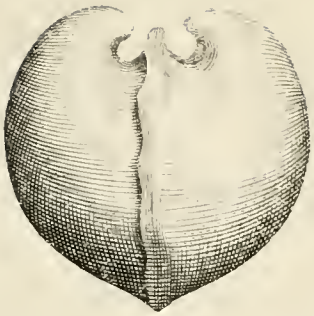

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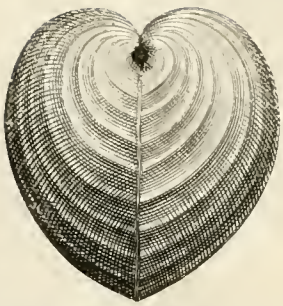

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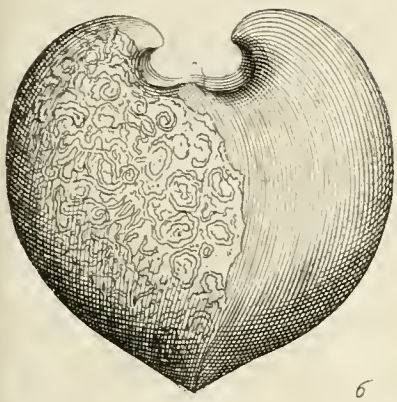

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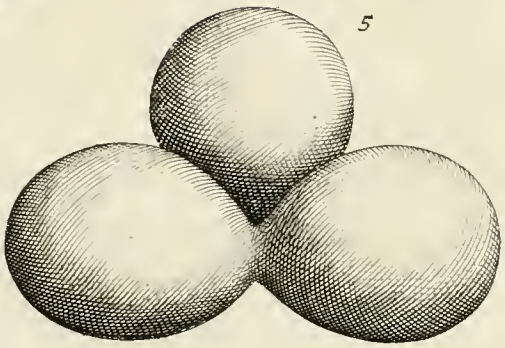

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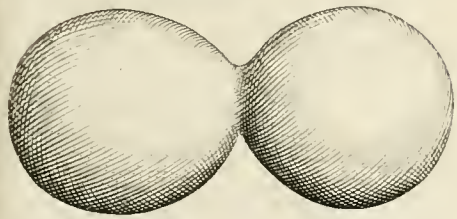

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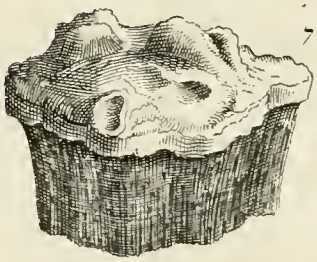

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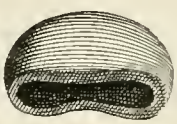

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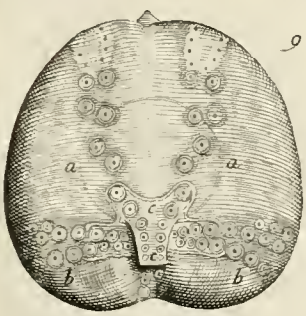

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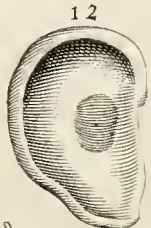

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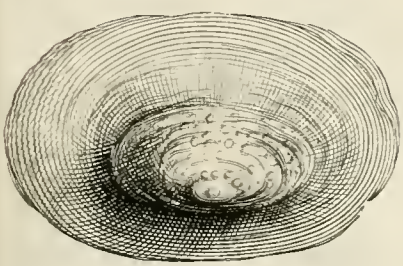


To the right Worsp.ll
Sr. IOHN D'OYLY Baron.t in whom lodg
all the virtues of HIS ancient house.
This 7.th Table
of FORMED STONES with all due
respect is humbly presented by
R.P. LL.D.

preſenting the *glans* and *præputium penis humani*; but without any *frænum* faſtened to the *urethra*; Of which out of modeſty I have given no *ſculptures*.

154. To theſe add another *ſtone* which we may call *Lapis Nephriticus*, not from any likeneſs either in colour or effect to the *whitiſh green ſtone* uſed in diſtempers of the *Kidneys* (though the *ſignature* it carries might perſwade a tryal) but from the colour and figure it has of the *Kidney* of an *Animal*, with a *trunck* of one of the *Vreters* deſcending from the hollow of it, as in *Tab.* 8. *Fig.* 3. This *ſtone* was lent me by the Reverend and univerſally Learned Dr. *Ralph Bathurſt*, *Vice-Chancellor* of *Oxford*, and *Dean* of *Wells*, one of the moſt cordial *Encouragers* of this *deſign*; who found it hanging to an *Oyſter* by that *part* which repreſents the *Ureter*, which was then ſo ſoft that he eaſily cut it away with his knife; but within leſs than an hour (like the *Gorgonia* of *Pliny**) it grew as hard as the reſt of the *ſtone*, which I gueſs may be equal to that of a *Pebble*: preſerving, I ſuppoſe, its native ſoftneſs whil'ſt it enjoyed the *ſalt ſteams* in the heap of *Oyſters*, and not hardning till expoſed to the purer *Air*; which evidently ſhews (though the opinion be exploded of *Coral*) that there are indeed ſome other *Sea* things, ſoft under water, or whil'ſt they enjoy the ſteams of it, that as ſoon as expoſed to the freſher *Air*, become preſently *ſtones*.

155. Next the *ſtones* that relate to either of the three *Ventricles*, come we next to ſuch as concern the *Artus*, or other *members* of the *body*: Amongſt which, I have one dug out of a Quarry in the Pariſh of *Cornwell*, and given me by the ingenious Sir *Thomas Pennyſton*, that has exactly the figure of the lowermoſt part of the *thigh-bone* of a *Man*, or at leaſt of ſome other *Animal*, with the *capita femoris inferiora*, between which are the *anterior* (hid behind the *ſculpture*) and the larger *poſterior ſinus*, the ſeat of the ſtrong *ligament* that riſes out of the *thigh*, and that gives ſafe paſſage to the *veſſels* deſcending into the *leg*: And a little above the *ſinus*, where it ſeems to have been broken off, ſhewing the *marrow* within of a ſhining *ſpar-like* ſubſtance, of its true colour and figure, in the *hollow* of the *bone*, as in *Tab.* 8. *Fig.* 4. In compaſs near the *capita femoris* juſt two foot, and at the top above the *ſinus* (where the *thigh-bone* is as ſmall as any

* *Nat. Hiſt. lib.* 37. *cap.* 10.

where) about 15 inches; in weight, though repreſenting ſo ſhort a part of the *thigh-bone*, almoſt 20 pounds.

156. Which are *dimenſions*, and a *weight*, ſo much exceeding the ordinary courſe of *nature*, that by *Agricola*[e], *Cæſalpinus*[f], and *Kircher*[g], ſuch *ſtones* have been rather thought to be formed either in hollows of Rocks caſually of this *figure*, and filled with *materials* fit for *petrification*; or by ſome other ſportive *plaſtic power* of the Earth, than ever to have been real *bones*, now *petrified*.

157. And that indeed there are *ſtones* thus naturally faſhioned, muſt by no means be doubted, ſince no queſtion the ſtony teeth of which there are Cart-loads to be had in a *Cave* near *Palermo*, beſide others in the ſhape of *leg* and *thigh-bones*, and of the *Vertebræ* of the *back*, are no others than ſuch[h]. None of them, as the judicious *Charles* Marqueſs of *Ventimiglia* well obſerved, having any *ſigns* of *hollowneſs* for the place of the *marrow*, much leſs of the *marrow* it ſelf.

158. Which has fully convinced me that this *ſtone* of ours was not ſo produced, it having thoſe *ſigns* exquiſitly expreſſed; but muſt have been a real *bone*, now *petrified*, and therefore indeed not properly belonging to this place. However, it being now a *ſtone*, and not coming to my hands whilſt I was treating of *petrifications*, I have rather thought fit to throw my ſelf upon the *Readers* candour, and *miſ-place* it here, as I did the *Adarce*, than altogether to omit ſo conſiderable an inſtance.

159. But againſt this opinion of its having been once a *real bone*, there lies a conſiderable *objection*, *viz.* that it will be hard to find an *Animal* proportionable to *it*, both *Horſes* and *Oxen* falling much ſhort of *it*. To which if it be anſwer'd, that it may be much increaſed in the *petrification*; it may again be replyed, that though indeed there be an *augment* in ſome *petrifications*, yet that it is not ſo in *all*: for though in all *petrifications* there be an ingreſs of *ſteams* and *particles* that were not there before, and therefore either a ceſſion of ſome other body required, or a neceſſary *augmentation*; yet that thoſe *petrifying ſteams* are ſomtimes ſo thin and fine, that they require only the *ceſſion* of ſome *Airy* or *Æthereal atoms* contained before in the porous parts of

[e] *De Natura Foſſilium, lib.* 7. [f] *De Metallicis, lib.* 2 *cap.* 48. [g] *Kircheri Mundus ſubterran. lib.* 8. *ſect.* 2. *cap.* 4. *diſq.* 2. [h] *Idem loco citato, diſq.* 1.

the

the *body* to be changed, as indeed it appears to have been in this *inſtance* of our *petrified bone*: for with it was found a *tooth*, depicted *Fig.* 5. in its exact bigneſs, weighing two ounces and $\frac{1}{4}$, not at all *petrified* but perfect *bone* ſtill, rather exceeding than any thing ſhort of it in *proportion*; whence it muſt neceſſarily be concluded, that there could be but little if any *augmentation* at all.

160. And if it be aſked how it ſhould come to paſs that the *thigh-bone* ſhould be *petrified*, and not the *tooth*, it may be anſwered, and that *experimentally* too, that *teeth* admit not ſo eaſily of any change or *petrification*, becauſe they are much more cloſely compacted *ſubſtances* than any other *bones*; whence 'tis, that we ſo often find them ſound and good, when all other *bones* are conſumed. Thus at *Bathendown*, or *Bannerdown* (the *Mons Badonicus* of *Nennius*) not far from *Bath* in *Somerſet-ſhire*, there have been Cap fulls of *teeth* picked up by ſuch as followed the Plough [i], but we are told of no other *bones* found there. And we are informed by *Fazellus*, in his Hiſtory of *Sicily*, that of two *Giants Sceletons*, one found by *Johannes à brachiis fortibus*, in the Field *Gibilo*, a mile South of the Town *Mazarenum*, now *Mazara*; and the *other* by *Paulus Leontinus*, not far from *Palermo*, that when they came to be touched, all fell into duſt but the *dentes molares*, or the greater teeth called the *Grinders* [k], ſufficient Arguments (I had almoſt ſaid) of their unalterable ſtate.

161. Since then it ſeems to be manifeſt, that the cize of the *bone* has been ſcarce alter'd in its *petrification*: It remains, that it muſt have belong'd to ſome greater *Animal* than either an *Ox* or *Horſe*; and if ſo (ſay almoſt all other *Authors* in the like caſe) in probability it muſt have been the *bone* of ſome *Elephant* brought hither during the Government of the *Romans* in *Britan*: But this opinion too lies under ſo great difficulties, that it can hardly be admitted; which are briefly theſe.

162. Firſt, That we do not find that any of the *Roman Authors*, who elſewhere are large enough in deſcribing the *Elephants* behavior in *fight*, and how terrible they were to ſome of the *Trans-Alpine* Nations, mention any ſuch matter in any of their *Expeditions* into *Britan*. *Dion* [l], 'tis true, ſays, That *Clau-*

[i] *Stow*'s Annals, in the Life of King *Arthur*. [k] Tho. Fazelli *de rebus Siculis Decad prioris, Lib.* 1. *cap.* 6
[l] Dionis Caſſii *Rom. Hiſt. lib.* 60.

dius

dius Cæsar, when he was called to the assistance of the *Prætor Aulus Plautius*, sore pressed by the *Britans*, then revenging the death of their slain Prince *Togodumnus*, amongst other preparations, gathered together his *Elephants*, περὶ τε ἄλλων, καὶ Ελεφάντων προσωμάλεκτο, are his very words. But *Suetonius* in his life, where he is very particular concerning this *Expedition* into *Britan*, mentions no such matter; nor indeed doth *Dion* say, that he brought *them* hither with *him*, only that *he* gather'd *them* together in order to it. But they both agree in this, that *he* met with such storms in his intended passage by *Sea* thither, that he was forced to put in at *Marseilles*, and march by Land quite through *France* to *Gessoriacum*, now supposed to be *Boulogne*, from whence 'tis true he passed over to *Britan*. But so swift was his motion in this *Expedition*, that they also both agree, that he was returned to *Rome* again within six months, a time scarce agreeable with the motion of so unwildy Creatures as *Elephants*; which in all likelyhood were therefore left behind at *Marseilles*, because hindered by the weather of their Sea portage, and never transported into *Britan* at all. Nor find I in other *Authors*, that it was ever after attempted. One there was, 'tis true, sent hither as a present by St. *Lewis* the 9th, King of *France*, to King *Henry* the Third, *Anno* 1255. which, says *Matthew Paris* *, was the first seen on this side the *Alps*; and perhaps there may have been two or three brought for shew hither since: but whether it be likely any of these should be buryed at *Cornwell*, let the *Reader* judge.

163. Beside, had this *thigh-bone* and *tooth*, and the several others that have been found in *England*, such as the two *teeth* taken up at *Edulfsness* in the County of *Essex*, in the Raign of King *Richard* the *First*, that might have been cut into two hundred of an ordinary cize[m]; and divers other *bones* and *teeth* found at *Chartham* near *Canterbury*[n], and *Farley* near *Maidstone* in *Kent*, whereof I have one now by me, dug up and given me, by the truly Noble and Ingenious *Jacob* Lord *Astley*, near seven inches round, and five ounces and $\frac{1}{8}$ in weight, of which more when I come into *Kent*. Had, I say, these *bones* and *teeth* been ever the spoils of *Elephants*, we should certainly at some time or

* Matth. Paris *in Reg. Hen.* 3. *in Anno Dom.* 1255. [m] *Cambden* in *Essex*. [n] *Chartham* news, set forth by Mr. *Joh. Somner*.

other

other have met alſo with thoſe greater *Tusks* with which they are armed, of which I have not heard there have been any yet found in *England*, nor any thing like them.

164. Add hereunto what prevails with me much, that ſince the great conflagration of *London*, *Anno* 1666. upon the pulling down of St. *Mary Wool-Church*, and making the ſite of it into a *Mercat-place*, there was found a *thigh-bone* (ſuppoſed to be of a *Woman*) now to be ſeen at the *Kings-head Tavern* at *Greenwich* in *Kent*, much bigger and longer than ours of *Stone* could in proportion be, had it been intire. We have alſo here at *Oxford* *, a *thigh-bone* that came from *London*, three foot and two inches long, which I gueſs may be of an agreeable proportion with ours. And the ſame day I brought the tooth from *Cornwell*, there were two others happily procured for me by my worthy Friend *Samuel Fowler* A. M. dug up in the Pariſh Church of *Morton Valence*, about ſeven miles from *Gloceſter*, in the way thence to *Briſtol*, in all points ſo exactly like the other from *Cornwell*, in ridges, cavities, *&c.* that had they not differ'd ſomwhat in colour, they could ſcarce have any way been diſtinguiſh'd. Now how *Elephants* ſhould come to be buryed in *Churches*, is a queſtion not eaſily anſwered, except we will run to ſo groundleſs a ſhift, as to ſay, that poſſibly the *Elephants* might be there buryed before *Chriſtianity* floriſh'd in *Britan*, and that theſe Churches were afterward caſually built over them.

165. If it be urged out of *Ponticus Virunnius*, and ſome others, that the Emperor *Claudius* was at *Gloceſter*, and that he built that City after his own name, in memory of the Marriage of his fair Daughter *Genniſſa*, with *Arviragus* then King of *Britan* °, where poſſibly he might have ſome of his *Elephants* with him, which might dye and be buried thereabout. It muſt be anſwered, that notwithſtanding the name of *Claudii Caſtrum*, now *Gloceſter*, ſeems ſo much to favor the ſtory in hand, that yet in all likelyhood there was never any ſuch matter: For neither *Suetonius* [P], who numbers up all the Daughters that he had, and ſhews how given in Marriage. Nor *Dion* [q], who do's the ſame (who lived in his time, and had born the Office of *Conſul*) remember any ſuch Daughter, or ſo diſpoſed of to *Arviragus*.

* In the Medicine School. ° *Pont. Virunnii, Hiſt. Britan. lib.* 4. [P] *Sueton. in vita Claudii.* [q] *Dion. Caſſ. Rom. Hiſt. lib.* 60.

166. Be-

166. Beſide, how was it poſſible that *Claudius*, who came hither, and was returned again to *Rome* within ſix months, ſhould find ſo much time, as to come up ſo far in the Country as *Gloceſter*, much leſs to celebrate ſuch a Marriage, and build that *City*, ſince the ſame *Dion* expreſly ſays, that of thoſe ſix months time, he was here in *Britan* but ſixteen days, ἀφ' ὧν, ἑκκαίδεκα μόνας ἐν τῇ Βρεττανίᾳ ἡμέρας ἐποίησε, are his own words [r], and thoſe ſixteen days in all probability, were ſpent in ordering his Army, and joyning them with the Forces of *Plautius* that lay then at the mouth of *Thames* ready to receive him, and in taking of *Camulodonum*, which the ſame *Author* aſſerts he did that *Expedition*, and ſo immediatly returned.

167. But what is *inſtar omnium* in this difficult point, there happily came to *Oxford* while I was writing of this, a living *Elephant* to be ſhewn publickly at the Act, *An.* 1676. with whoſe *bones* and *teeth* I compared ours; and found thoſe of the *Elephant* not only of a different ſhape, but alſo incomparably bigger than *ours*, though the Beaſt were very young and not half grown. If then they are neither the bones of *Horſes*, *Oxen*, nor *Elephants*, as I am ſtrongly perſwaded they are not, upon compariſon, and from their like found in *Churches*: It remains, that (notwithſtanding their extravagant magnitude) they muſt have been the bones of *Men* or *Women*: Nor doth any thing hinder but they may have been ſo, provided it be clearly made out that there have been *Men* and *Women* of proportionable ſtature in all *ages* of the World, down even to our own days.

P68. The Sons of *Anak*, no queſtion, were very great men, and *Goliath* for certain was nine foot nine inches high [s]. We read alſo of the *Sons* of the *Titans*, and of high *giants* [t], and of *Giants* famous from the begining, that were of great ſtature and expert in War [u]. And (to omit the Fables of the *Giants* of Mount *Erice* near *Drepanum* in *Sicily*, 200 cubits high, of *Tanger* in *Mauritania* 60 cubits [w], and of the *Giant* found ſtanding in a Rock, cleft by an Earth-quake in the Iſle of *Candy*, 46 cubits, ſuppoſed to be *Orion*, or *Otus* [x], and ſeveral others mentioned by *Phlegon* *.) Amongſt the *Romans*, *Theutobochus* King of the *Teutones* or *Germans*, vanquiſh'd by *Marius*, is reported by *Florus* to be *inſigne*

[r] *Idem loco citato.* [s] 1 Sam. c. 17. v. 4. [t] Judith 16. v. 7. [u] Baruch 3. v. 26. [w] *Vid. Athan. Kirckeri Mundum ſubterr. lib.* 8 *ſect.* 2. *cap.* 4. [x] *Plin. Nat. Hiſt. lib.* 7. *cap.* 16. * *Phlegon Trallianus de rebus mirabilibus, cap.* 11, 12, 17, 18, 19.

triumphi

phi ſpectaculum, ſo very tall, that he was ſeen above all the *Trophees* [y], which were the ſpoils of the *Enemies*, uſually carryed aloft upon the tops of ſpears. *Nævius Pollio*, ſays *Pliny* [z], was ſo great a *Giant* (having no account of his dimenſions) that it was taken for a wonderful ſtrange thing, that when a great preſs of people came running upon him, he had like to have been killed.

169. But to come cloſer to the buſineſs, and more determinate ſtatures, the ſame *Pliny* [a] tells of two others living in the time of *Auguſtus*, nick-named *Puſio* and *Secundilla*, whoſe bodies were preſerved for a wonder in the *Saluſtian* Gardens, that were ten foot high: and that in his time there was one *Gabbara*, brought out of *Arabia*, in the days of Prince *Claudius* the Emperor, exactly of the height of *Goliath*, *viz.* nine foot nine inches high [b]; which being a cize very proportionable to our bone found at *Cornwell*, I am rather inclined to believe, that *Claudius* brought this *Gabbara* into *Britan* with him, who poſſibly might dye and lay his bones here, than that ever they belonged to any *Elephant*; except we ſhall rather ſay, that here alſo *Corinæus*, coſin to *Brute*, might kill one of *Gogmagog*'s race, and that from him the place doth take his name, as well as the County of *Cornwall*.

170. Moreover, that there were men heretofore of ſuch vaſt ſtatures, we have the teſtimony of *Joſephus* [c], in his Antiquities of the *Jews*, where he tells us of one *Eleazar*, a Jew born, ſent amongſt the Preſents to *Tiberius*, when *Darius* the Son of *Artabanus* King of *Perſia*, after a Peace made, went as a Hoſtage to *Rome*, that was full ſeven Cubits in height. And there is a *Sceleton* [d] now to be ſeen in the Town-hall at *Lucern*, found under an old Oak in the County of *Williſau*, near a Village called *Reyden*, within the juriſdiction of that City, that gives further confirmation, it having all, or moſt of the bones wherein a Man differs from other *Animals*, and being above ſeventeen foot high.

171. And if we conſult the latter *ages* of the World, we ſhall ſtill find that there were always ſome few perſons vaſtly exceeding the ordinary ſtature of Men: *Joh. Caſſanio* [e], though no fa-

y *Flori Hiſt. Rom. lib* 3. *cap.* 3. z *Nat: Hiſt. lib.* 7. *cap.* 16. a *Idem loco citato.* b *Idem loco citato.* c *Lib.* 18. *cap.* 6. d *Kircheri Mund. ſubterr. lib.* 8 *ſect.* 2. *cap.* 4. e Io. Caſſanio *Monaſtr. de Gigantibus*, *cap.* 6.

vorer of the ſtories of Giants, yet tells us of one that lived about 150 years ſince at *Burdeaux* in *Aquitan*, commonly called the Giant of *Burdeaux*, whom *Francis* the firſt, King of *France*, paſſing that way, beheld with admiration, and gave eſpecial command that he ſhould be of his Guard: but he being a Peaſant of a narrow ſoul, and not pleaſed with a Courtiers life, quitted his *Halbard*, and got away by ſtealth to the place whence he came: Of whom the ſaid *Caſſanio* was aſſured by an Honorable Perſon, who had ſeen him *Archer* of the Guard, that he was of ſo great a height, that a Man of an ordinary ſtature might go upright between his legs when he did ſtride. And *Thuanus*[f] treating of an Invaſion made by the *Tartars* upon the *Polanders*, in the Year 1575. tells us of a *Tartar* ſlain by one *Jacobus Niezabilovius* a *Polander*, whoſe fore-head was 24 inches broad, and his body of ſo prodigious a bulk, that as he lay dead on the ground, his carcaſs reached to the navel of a perſon ſtanding by him.

172. *Geropius Becanus*[g], Phyſitian to the Lady *Mary*, ſiſter to the Emperor *Charles* the Fifth, Queen of *Hungary* and *Regent* of the *Netherlands*, aſſures us, That there dwelt a perſon within five miles of him ten foot high, and that himſelf ſaw a Woman of the ſame height. The talleſt that I have yet ſeen in our days, was alſo a Woman of a *Dutch* extraction, ſhewn publickly here at *Oxford*, ſeven foot and a half high, with all her Limbs proportionable: when ſhe ſtretch'd forth her arm, Men of ordinary ſtature might walk under it; and her hand, from the *carpus* or wriſt where it is joined to the *radius* of the arm, to the end of the middle finger, was full ten inches long. A ſtature, 'tis true, much ſhort of any of the afore-mentioned, and indeed I believe it will be hard to meet with their fellows in theſe parts of the World, where Luxury has crept in, together with Civility: Yet if we look abroad amongſt the preſent barbarous Nations of both *Indies*, where they live ſtill according to *Nature*, and do not debauch her with the ſenſual Delights of the more civilized World, we ſhall find (if the Relations either of *Engliſh* or *Hollanders* be of any credit) that there are now *men* and *women* adequate to them in ſtature; ſeveral having been ſeen, eſpecially about the Straights of *Magellan*, of ten: and one near the River of *Plate* by *Tho. Turner*, 12 foot high.

[f] *Jac. Aug. Thuani Hiſt. Tom.* 3. *lib.* 61. [g] *De Gigantomachia.*

173. whence

173. Whence 'tis plain, that whether we reſpect the more ancient or modern Times, 'tis poſſible enough theſe bones from *Cornwell* might be the bones of a *man* or *woman*, there being no decay apparent in the conſtitutions of Mankind from the beginning to this day, but what is adventitious and accidental; ſaving in the longevity of the *antediluvian Patriarchs*.

174. Beſide this *Gigantick* thigh-bone, there is another *ſtone* at the foot of *Shotover*-hill, amongſt the *Orchites* before-mentioned, *Sect.* 144. that alſo repreſents one of the *Artus*; *viz.* the Leg and Foot of a Man cut off above the *ancle*, as in *Tab.* 8. *Fig.* 6. which from the toe to the heel is about a yard long, and perhaps in the whole may weigh 50 or 60 pounds: But I take not this for a petrification as the former, but a ſtone formed in this ſhape purely by Nature, which may therefore be termed *Andrapodites*, as might all thoſe of the kind mentioned by *Wormius* [h]. To which alſo may be added the *Lapis acetabulum referens*, whereof there is plenty on the *Chiltern*-hills. And a ſort of *Oſteocolla* found in *Heddington* rubble Quarries, which ſcraped, has the ſmell of burnt bone, and may I ſuppoſe be the ſame mentioned by *Geſner* *, that was ſent him by *Peter Coldeberg*, Apothecary of *Antwerp*.

175. After the Stones that relate to the parts of *Animals*, come we laſtly to thoſe that reſemble things of *Art*, ſuch as that in the form of a *button-mold*, *Fig.* 7. whereof there were ſeveral found in the very ſame Quarry with the *thigh-bone* and *tooth*, in the Pariſh of *Cornwell*, and no doubt did belong to the owner of thoſe *bones*: And the other in the ſhape of the *heel* of an *old ſhoo*, with the *Lifts* plainly to be diſtinguiſh'd, as in *Fig.* 8. which was found ſomwhere near *Oxford*, and given me by the Right Reverend and profoundly Learned, *Thomas* Lord Biſhop of *Lincoln*, one of the firſt *Promoters* of this Deſign. But both theſe I take to be but *petrifications*, and therefore miſ-placed here like the *Adarce* and *thigh-bone*.

176. But I have another ſort of *button-ſtone*, ſent me from *Teynton*, which I take to be a meer production of *Nature*, finely ſtriated from the top as I have ſeen ſome *hair* buttons, as in *Fig.* 9. and may therefore be called *Porpites*: Except we ſhould rather take it for a new ſort of *Echinites*, not yet diſcover'd, which

[h] *Muſæi Wormian. cap.* 13. *Integrum pedem hominis in lapidem verſum, ſpectandum habet Muſæum Calceolarium*, Ioh. Bapt. Olivus, *p.* 68. * Geſner *de Fig. Lapid. cap.* 12.

is wholly left to the *Readers* choice.

177. In the Quarry of rubble ſtone near *Shotover*-hill, I met with a *Spar-like ſtone*, made I ſuppoſe of the dropings of petrifying water, not unlike to the bags called *Manicæ Hippocratis*, uſed in *filtrations* by the *Chymiſts*, three one above another as they uſually place them, as in *Fig.* 10. And in the very ſame Quarry I found a ſingle *Trochites* of a cinereous colour, ſo called from its likeneſs to a *wheel*, having *rays* coming forth of its *center*, like the ſpoaks of a Cart-wheel from its ſtock, hub, or nave: Theſe are ſaid to have affinity with the *Lapis Judaicus* in their texture [i], and with the *Aſteriæ* in the property of moving in *Vinegar* [k], neither of which I could well try, having but *one*, and that too ſet in a rubble ſtone of the Quarry. They are found plentifully Northward in *Holy-Iſland*, and in the bottom of the Chanel of the River *Tees* [l], at *Braughton* and *Stock* in *York-ſhire*, at *Beresford* in *Stafford-ſhire* [m], and are commonly there called St. *Cuthbert*'s Beads, whereof I intend *Cuts*, and ſhall treat more at large when I come to thoſe places.

178. At the Pariſh of *Heath* I met with a reddiſh ſort of *ſtone*, in the uſual form of a *Whet-ſtone*, as in *Tab.* 8. *Fig.* 11. about four inches long, very hard, and for both thoſe reaſons not fit for uſe: it was given me by Mr. *Evans*, Rector of the place, and ſaid by him to be taken out of a block of ſtone dug in the Quarries thereabout, naturally having grown in that form. And at *Stonor* there was given me a criſp'd white ſtone, taken up not far thence, reſembling a ſort of *Sweet-meat*, not like the *Confetti de Tivoli*, but rather of *Viterbo* mentioned by *Aldrovandus* [n], or a ſort of Sweet-meat we have from *Portugal*.

179. Amongſt the *ſtones*, like things of *Art*, I think I muſt alſo number a ſort of *globular iron-colour'd balls*, taken up about *Cornwell*; whereof I have two given me by Sir *Thomas Pennyſton*; the one *plain* and ſmooth, the other *granulated* on the out-ſide, not unlike to an *Orange*, very weighty, and made up within of a golden ſtriated ſubſtance from the *center* to the circumference, ſhewn in the *Hemiſphere* of one of them, *Fig.* 12. Of theſe there are ſome ſo equally round, as if done by *Art*; and ſo they are ſays *Cambden* at *Huntley Nab* [o], where under the craggy Rocks

[i] *Boet. de Lapid. & Gem. cap.* 227. [k] Geo. Agricola *de Natura Foſſilium, cap.* 5. [l] Mr. *Ray*'s Topograph. obſervat. *p.* 110. [m] Philoſoph. Tranſact. Num. 100. [n] *Muſæum Metallicum, lib.* 4. *p.* 518. [o] *Cambd.* in the North-Riding of *York-ſhire*.

they

they lye ſcatter'd here and there of divers bigneſſes, ſo artificially by Nature shaped round in manner of a Globe, that one would take them to be great *bullets*, caſt for *ſhot*, to be diſcharged out of great *Ordnance*. Such as theſe are alſo mention'd by *Joh. Kentmannus*, found *inter lapides ærarios*, which if broken (ſays he) are like the *ſilver* or *cinereous Marchaſite*, out of which ſomtimes *braſs* or *ſilver* are ſmelted [p], than which ours are ſomwhat of a better colour, but whether poſſeſt with thoſe or a better *metal*, I muſt confeſs I have not tryed, and therefore cannot inform the *Reader*.

180. Hither alſo muſt be referred a *round ſtone* before mentioned, *chap.* 3 *ſect.* 30. containing within it a white ſort of *earth*, and therefore called *Geodes*, or the *pregnant ſtone*; differing from the *Ætites* in this, that whereas that has within it a movable *ſtone*, by the *Naturaliſts* called *Callimus*; this contains only *earth* or *ſand*, that moves not at all: The outward cruſt of theſe is ſomtimes only an indurated *chalk*, under which are ſome other folds like the coats of an *Onyon*; and when found thus, by the Inhabitants of the *Chiltern* (where they are moſt plentiful) they are called *chalk Eggs*. Others there are of them, whoſe outermoſt *coats* are hard black Flints, ſome very thin, and others thicker, according I ſuppoſe to the ſeniority of their generation: For I have ſome of them by me whoſe *coats* are not much thicker than the ſhell of a *Wall-nut*, others ſtone half way, and others ſo almoſt to the very *center*; and theſe Flint *coats* black without ſide, and gradually whiter and whiter, as they approach nearer to the whitiſh earth contained within: whence I am almoſt perſwaded, that however it may be in irregular Flints, that in theſe the chalky matter does turn into *ſtone*, and is the chief principle of their generation.

181. Upon the *Chiltern-hills*, near to *Sherbourn* and *Lewkner*, I found many of the Flints inclining to a *Conical* Figure. And in the gravel about *Oxford*, I have ſeen *faſciated* Pebbles, having as it were *Zones* or *girdles* round them, of different colours from thoſe of the *ſtones*. About *Fawler* and *Stunsfield*, the Pebbles before mentioned, *cap.* 4. *ſect.* 18. are moſt of them ſtreaked with *iron-colour'd lines*, ſomtimes inclining towards one another like the ramifications of a *Dendrites*; which though not ſo curious as

[p] *Catalog. Foſſilium, Tit.* 16. *de Lapid. ærariis à natura effigiatis.*

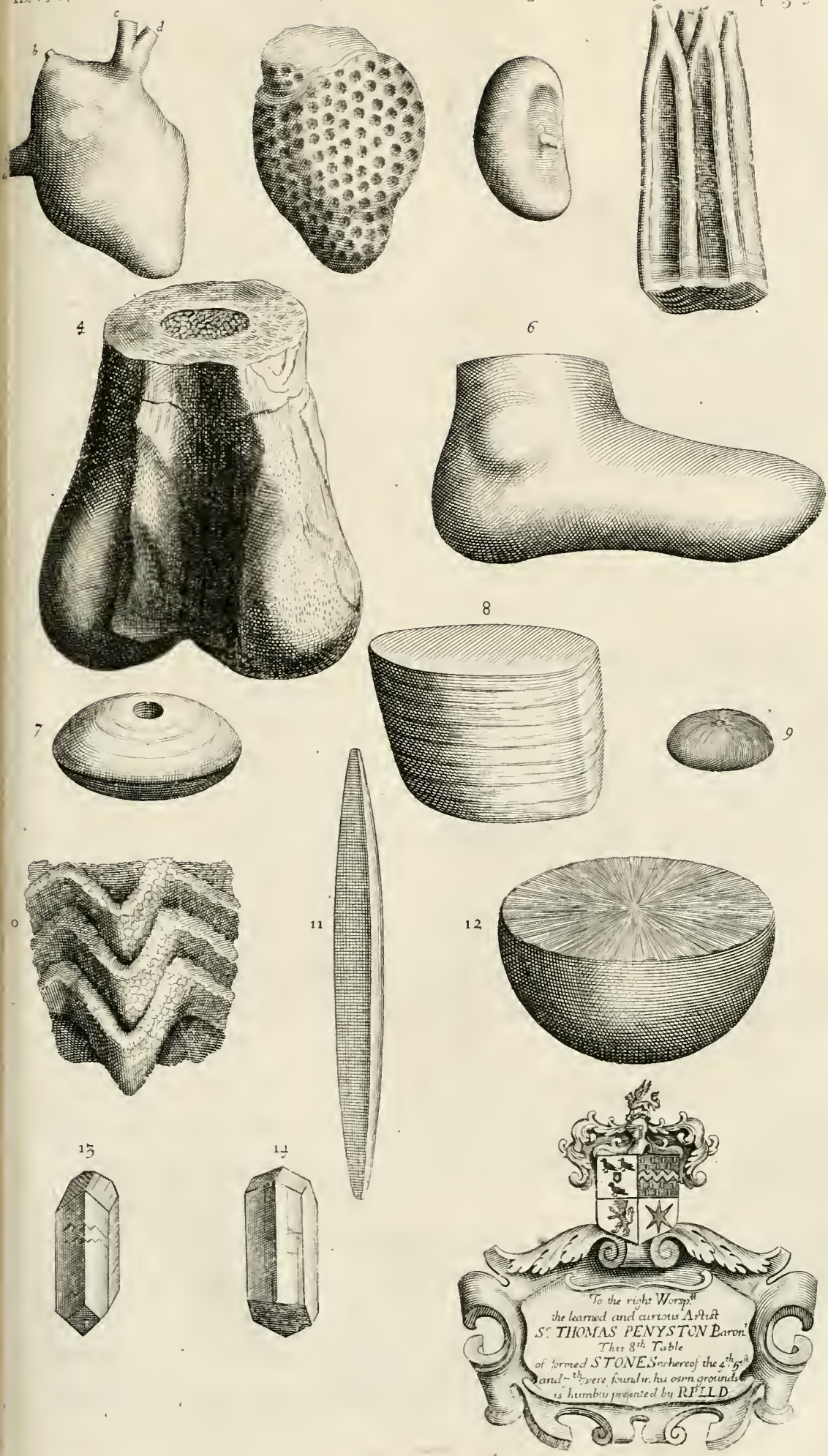
the

the *Pietra di figure de boschi* of *Ferrante Imperato*[q], yet fit me well enough with a transition to the *Chapter of Vegetables*, which immediatly follows.

182. Only I must beg leave first to advertise the *Reader*, that what I have ascribed to Dr. *Merret* concerning the *Toad-stone*, *sect.* 146. I have found since the Printing of that sheet, seemingly also given to the Learned Sir *George Ent*, by the no less Learned Sir *Thomas Brown*, in the last Edition of his *Pseudodoxia Epidemica*[r], to whether more rightly, let them contend. And that since the Printing the beginning of this *Chapter*, I received from the Right worshipful Sir *Philip Harcourt* of *Stanton Harcourt*, two kinds of *Selenites*, though of the same texture, yet much differently formed from any there mention'd; both of them being *Dodecaëdrums*, but the *Hedræ* too as much different from one another, as from any of the former: The first sort of them being made up of two *Rhomboideal* sides, four oblong, and as many shorter *pentagons*; and two small *Trapeziums*, one half whereof are represented *Tab.* 8. *Fig.* 13. And the second, of two oblong *Hexagons*, four oblong *Trapeziums*, four oblong *parallelograms*, and two large *pentagons*, one half whereof are also represented *Fig.* 14. In both which it is to be understood, that the *Hedræ* at the ends of each *stone*, are opposed by two others like them, not according to the breadth, but length of the *stone*. The two *pentagons* at the top of the *stone*, *Fig.* 13. being opposed by two others like them, behind the small *Trapezium* at the bottom of it; and the small *Trapezium* at the bottom, by another like it behind the two short *pentagons* at the top; and so the oblong *parallelograms*, and large *pentagons* at the ends of the *stone*, *Fig.* 14.

[q] *Dell' Hist. Naturale lib.* 24. *cap.* 24. [r] *Pseudodox. Epidem. lib.* 3. *cap.* 13.

CHAP.



To the right Worsp.ll
the learned and curious Artist
S.r THOMAS PENYSTON Baron.
This 8th Table
of formed STONES where of the 4th 5th
and 7th were found in his own grounds
is humbly presented by RP LLD

CHAP. VI.

Of Plants.

NEXT *Inanimate* things, I proceed to ſuch as have *Life*; amongſt which, firſt of thoſe that hold the loweſt place, that exerciſe the moſt *univerſal*, and therefore *inferior* Faculties, ſuch as *Herbs*, *Shrubs*, *Trees*, all which are contained under the general name of *Plants*: But of theſe I intend not a compleat *Catalogue* (that being a ſubject of it ſelf large enough for a *Volume*) but only a ſhort account,

1. Of the *Indigenous Plants* of the *County*, which yet either
   1. Are not deſcribed by any *Author* that we know of, or
   2. Have not been noted by the ingenious Mr. *Ray*, in his excellent *Catalogue*, to be of *Engliſh* natural growth; or
   3. Have indeed been noted, which yet remaining dubious, either as to the certainty of their *deſcription*, or *ſpecifical difference*, are cleared in this *County*.
2. Of the extraordinary *accidents* of well known *Plants*.
3. Of the *unuſual Plants* now cultivated in the Fields, under which head ſomwhat of the *Husbandry* of the *Country*.

according to which *method* I ſhall treat of all the three forementioned *Species* of *Plants*; *viz.* *Herbs*, *Shrubs*, *Trees*, ſo far forth as each of them will come up to it. And firſt, of thoſe ſtiled *herbaceous Plants*.

2. By which I underſtand all and only thoſe that are made up of a *ſucculent* and *carnous* ſubſtance, that never in any part will become *lignous*, (or hardly any of them retain it all winter) as *Shrubs* and *Trees* do: of which thoſe that are *indigenous*, and not deſcribed by any *Author* that we know of, are theſe that follow.

3. *Viola*

3. *Viola Martia hirſuta major inodora.* Which large *Violet* from a fibrous root ſendeth forth many leaves, each upon his own foot-ſtalk, neither creeping as the common *March*, nor branched as the common *Dog-violet*; its leaves and ſtalks are all *hairy* eſpecially on the back-ſide; they are alſo broader, larger, and more *pointed* than the ordinary *March Violets*, which occaſioned (as ſome think) the ingenious Dr. *Merret* to note it by the name of *Viola Trachelii folio* [s], but that certainly muſt be ſome different kind, the leaves of ours being all *invecked*, as in Tab. 9. Fig. 1. whereas the *Trachelia* are all *indented*: Amongſt the leaves grow large *flowers*, upon foot-ſtalks (as other *Violets*) of a pale blue colour, with white *lines* or *rays* iſſuing from the middle of them, but wholly without *ſcent*. They flower in *March* and *April*, and are commonly but abuſively ſold to the *ſhops* amongſt other *Violets*, they not being ſo good for any of thoſe uſes the *Apothecaries* put them to, as other *Violets* are. They grow plentifully in *Magdalen College* Cops, on *Shotover* hill, *Stow-wood*, and many other *places*.

4. *Viola paluſtris rotundifolia.* From the root of this Plant, which is *white*, and at equal diſtances *knotted* (whence only it ſends forth its *fibers* not downward, but *horizontally*) ariſe 3 or 4 (ſomtimes more) feeble ſmall *ſtalks*, each bearing at its top only a round leaf, as in Tab. 9. Fig. 2. Among which, about *April* come up the *ſtalks* of the *flowers*, ſlender, like thoſe of the *leaves*; the whole *Plant* being weak, and beholding to the neighboring *ones* for its ſupport. The *flowers* are all ſmall and blue, which being paſt, a long *Priſmatical ſeed-veſſel* ſucceeds, opening its ſelf when ripe into three parts, and ſhewing a rank of brown *ſeeds*, appended to each angle by white *Nerves*: This is eaſily diſtinguiſh'd from all other *Violets* by its native *place*, wherein it is ſuppoſed they will not grow; and by the ſmalneſs of its *flowers*, which are conſiderably *leſs* than any of the reſt; whereunto add the remarkable *roundneſs* of its leaves, which are ſo far from drawing to *points*, that the longeſt way of them is from ſide to ſide. *Cluſius* indeed ſeems to deſcribe a Plant like this, by the name of *Viola Alpina altera* [t], but makes its flower as much *greater*, as ours is *leſs* than the common *one*; adding beſide, that it flowers about the latter end of *June*, a month be-

[s] *Pinax rer. Nat. Britan. p.* 125. [t] *Car. Cluſii Plant. Hiſt. cap.* 13.

fore

fore which time the Seed of *ours* is ripe; which are differences ſo irreconcilable, that we cannot but pronounce *ours* as diſtinct from *his*, as from any other *Violets* before deſcribed by *Authors*, whereof we have conſulted *moſt*, if not *all* the beſt. It grows ſparingly in the Boggs about *Stow-wood*, and on the Banks of *Cherwell* between *Oxford* and *Water-eaton*; but moſt plentifully at *Chilſwell* in *Berkshire*, amongſt the moiſteſt Boggs.

5. *Juncellus omnium minimus capitulis Equiſeti.* This leaſt *club-ruſh* from ſmall hairy roots, riſeth no bigger than *horſe-hair*, and not above three inches high, bearing at the top a little *club*, as in the other *club-ruſhes*, but proportionably leſſer, as in Tab. 9. Fig. 3. where alſo it may be obſerved, that the *ruſh* riſes *ſingly* from the root, and not *branched*, like the *Fluitans* mentioned by Mr. *Ray* [u], who had he ſeen this, would certainly have owned different *ſpecies*'s of *club-ruſhes*, which he ſeems ſo much to doubt. It grows in *Binſey*-Common, in the moiſt ditches next the River *Iſis*.

6, *Geranium columbinum maximum foliis diſſectis.* Or the great jagged *Doves-foot Cranes-bill*, differs from the jagged *ones* of other *writers*, in that it is jagged at the firſt coming up, whereas all others are whole then; its leaves are alſo ſtanding on *long* foot-ſtalks, and much greater than thoſe of any other *Doves-feet*; from the middle of which there riſe up *great jointed* ſtalks, near the bigneſs of a *mans* finger, branched, and almoſt ſtanding upright a *yard* in height: At the *joynts*, which are largely knotted, are alſo large jagged leaves, which at the top grow very thick, amongſt which ſtand the flowers upon ſhort foot-ſtalks, as in Tab. 9. Fig. 4. of a bright and red colour, whereas the others are of a bluiſh purple; the *ſeeds* being like thoſe of other *Doves-feet*. This grows in hedges about *Marſton*, and on that part of *Botley*-Cauſey next *Oxford*, in great plenty.

7. *Pentaphyllum reptans alatum foliis profundius ſerratis.* This creeping *Plant* in all reſpects grows like the common *Cinque-foil*, but that at the bottom ſome leaves are found round and undivided like *Alchimilla*, and others dividing themſelves into *five*, are jagged but half way: As it increaſes in growth, the number of leaves oftentimes decreaſe, bearing four, three, two, and at the top, one; all which, have two little leaves or ears at the bottom

[u] *In Catalog. Plantar. Angl.*

of the foot-ſtalk, like *Tormentill:* The flowers are of the bigneſs and colour of common *Cinque-foil*, but generally made up of *four* leaves, as in *Tab.* 9. *Fig.* 5. and but very rarely to be found with five. It grows in the edges of the *Corn-fields* between *Hockley* and the Woods under *Shotover*-hill.

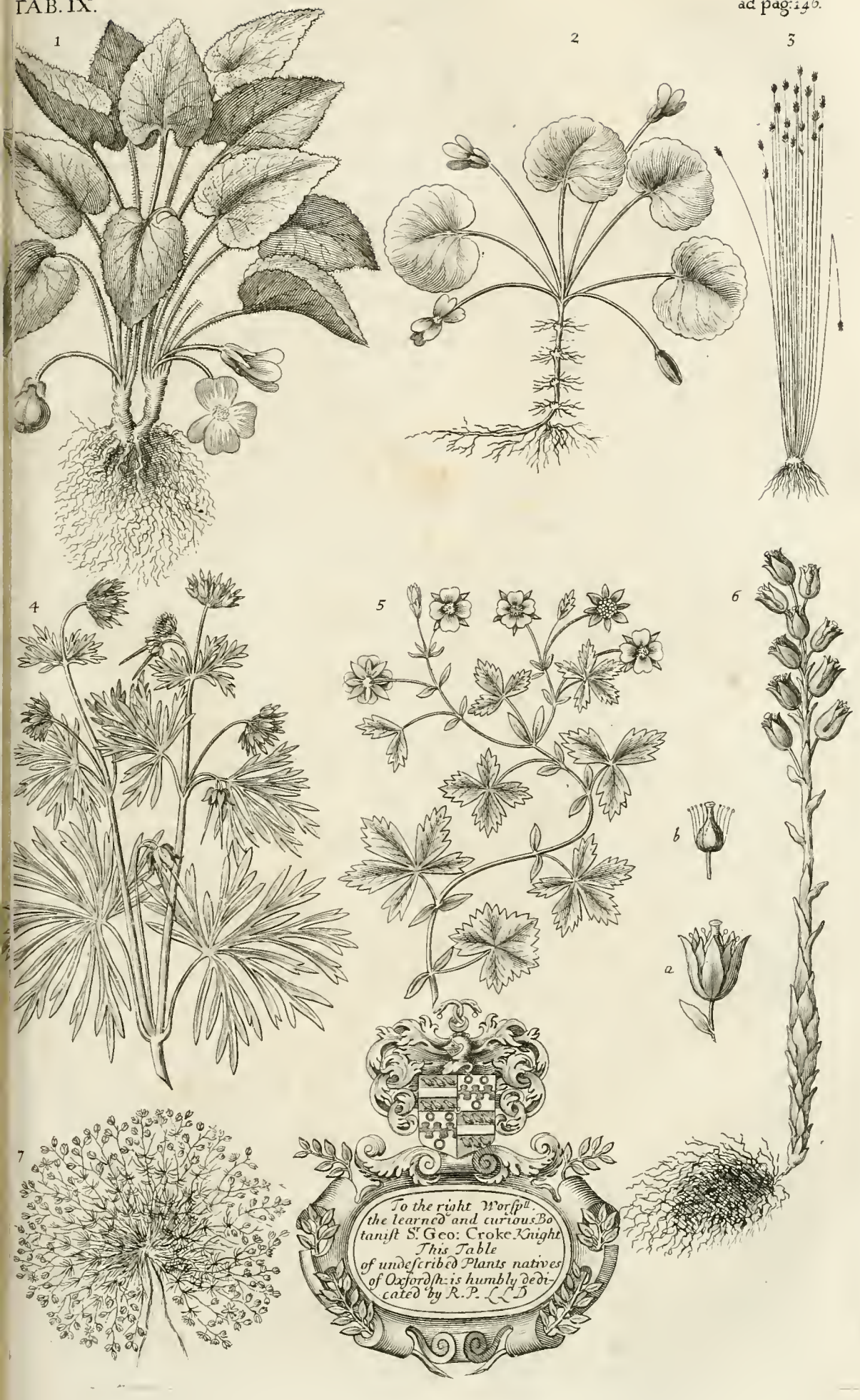
8. *Orobanche Verbaſculi odore.* The root of this *Plant* is *ſkaly* and obtuſe, to which are appended a bundle of complicated *Fibers*, like thoſe of *Nidus avis*, whence it riſeth up with a ſoft round very brittle *ſtalk*, ſeldom eight inches high, ſet with thin, ſmall, ſhort ſkaly leaves like *skins*, growing cloſe to it: At, or very near the top of which *ſtalk*, grow ſomtimes eight or ten ſmall *flowers*, altogether different from thoſe of the common *Orobanche*, each conſiſting of four pretty large *leaves*, within which are contained as many leſſer, as in Tab. 9. Fig. 6. About the *ſeed* veſſel (which is round at the bottom, with a narrow neck, and a hole at the top ſomwhat reſembling a *childs* ſucking-bottle, as in *Fig.* 6. *a*) ſtand ſmall *chives* with purpliſh tops, as in *Fig.* 6. *b.* The whole *herb*, *flowers*, *ſtalks* and *leaves*, are at the firſt flowering, of a whitiſh yellow, or ſtraw colour, and being broken or bruiſed, ſmell like the root of a *Primroſe.* It grows at the bottoms of Trees in the woods near *Stoken-Church*, and we find it mention'd in ſome MS. notes of the famous Mr. *Goodyer.*

9. *Saxifraga Anglica annua Alſine folio.* This ſmall annual *Saxifrage* from a ſmall *fibrous* root, ſpreadeth its *trailing jointed* ſtalks about an inch or two from it, at each *joint* come forth ſmall narrow leaves as in the other *Chickweed-break ſtone*, and from the upper *joynts* toward the end of the *ſtalks*, come ſmall *herbaceous* flowers made up of *four* leaves, which prove the caſe for the ſmall included *ſeed veſſel*, as in Tab. 9. Fig. 7. This *Plant* differs from the common *one*, which is of a *light freſh* green, *perennial*, and ſomtimes *roots* again at its *joynts*; in that its ſtalks and leaves are of a *browniſh* green colour, the *Plant annual* and never *reptant*: it grows plentifully in the walks of *Baliol College* gardens, and on the fallow Fields about *Heddington* and *Cowley*, and many other places.

10. To which perhaps I might add two different *Lychnis*'s from the *ſylveſtris flore albo Gerardi*, obſerved this Year by Mr. *Richard Stapley*; one whereof bears a white flower ſomwhat leſs than the common, yet at the *center* having another little *flowery circle*,

TAB. IX.

ad pag: 146.



circle, in the middle of which appear ſeveral fine *ſtamina*, with yellow longiſh *apices*, whereas the reclining *ſtamina* of the common *Campion* have no *apices* at all; the other alſo bears a white flower without that *flowery circle*, but has *ſtamina* crowned with roundiſh purple *apices*, with the duſt whereof the *flower* it ſelf is commonly *ſoiled*. But in the firſt of theſe the *ſeed veſſel* not appearing at all, and in the ſecond withering away with the *flower*; We are not ſo bold as to make them diſtinct *ſpecies*'s, not knowing as yet whence they ſhould be propagated. Theſe were found near *Holy-Well* in the Suburbs of *Oxford*, and grow alſo in the Corn-fields about *New-parks*, and as we ſuppoſe in moſt parts of *England*. *Sed de hoc quære*.

11. Beſide theſe, there is alſo another, of which *Authors* write ſo obſcurely, that we cannot poſitively ſay whether deſcribed or no: However, we have ventured to call it *Artiplex vulgaris ſinuata ſpicata*, it not being like the *Pes anſerinus alter ſive ramoſior* of *John Bauhin*, mentioned by Mr. *Ray*[w], in that it bears its *ſeeds* in *buttons* cloſe to the ſtalks, like the *Fragifera*. This grows equally common on Dung-hills with the *ſinuata major*, amongſt which we ſuppoſe it has hitherto lay hid.

12. As for the *Plants* deſcribed by other *Authors*, but not noted by Mr. *Ray* to be of *Engliſh* growth, we find only theſe in the *County* of *Oxford*. 1. *Clematis Daphnoides ſive pervinca major*, in the High-ways between *Woolvercot* and *Yarnton*, and in ſeveral *hedges* thereabout. 2. *Lagopus major vulgaris Parkinſoni*, in *Stow-wood* plentifully, and ſeveral other *places*. 3. *Oenanthe aquatica minor Park. ſive juncus odoratus Cordi*, in the ditches about *Medley* and *Binſey-Common*, and almoſt every where about *Oxford*.

13. Whereunto add ſome *others* indeed noted by Mr. *Ray*, but left in doubt whether *deſcribed*, or *different* from one another. Such are the *Helleborine flore albo*, mentioned in his *Appendix*[x] to grow in the woods near *Stoken-Church*, not far from the road leading from *London* to *Oxford*, which becauſe *he* had not ſeen either flowering, or green, modeſtly refuſed to determin whether deſcribed or no: But *we* having had time and curioſity of viewing it often in flower, find it to be the *Helleborine flore albo* of *Gerard* and *Tabernæmontanus*: *Epipactis anguſtifolia* of *Beſler*,

[w] *In Catalog. Plant. Angl.* [x] *In Appendice p.* 339. [y] Jac. Theod. *Tabernæmont. Part.* 2. *p.* 400.

in his *Hortus Eyſtettenſis* [z]: *Aliſma quorundam Cordi* [a], and *Aliſma Cymbaleanthemon Thalii* [b]. Which *Authors*, and others, we have diligently ſearched, and by comparing them together, find the *Plant* to agree with each *Figure*, as well as they could do one with another, had they (as indeed they commonly are) been Printed from one Plate.

14. The *Plants* which he doubts whether *ſpecifically diſtinct*, yet found *ſo* in *Oxford-ſhire*, are alſo *Helleborine*'s; the one his *Helleborine flore atro-rubente*, and the other *Helleborine latifolia montana* [c], both plentifully growing on *Stoken-Church* hills: Whereof the *former* has ſmall *narrow* leaves, ſomwhat like the *Paluſtris*, and growing *thicker* on the ſtalk; whereas thoſe of the *latter* are *broad* and much thinner, the *one* alſo flowering a full *month* after the *other*, which we take to be diſtinguiſhing *Characters* enough, though not ſo ſignally differing in the flowers as Mr. *Ray* owns his to do; our *latifolia montana* coming nearer to that of *Gerard*, then of *him* or *Dodonæus*, having purple flowers, but as deep or deeper than thoſe of the *Helleborine flore atro rubente*.

15. Of *Accidents* that are incident to *herbaceous Plants*, beſide what I have ſeen amongſt *forreigners* in Gardens, I have met alſo with ſome amongſt the *natives* of *Oxford-ſhire*; which I gueſs may happen to *them* (as likewiſe to all *others*) moſt times through *exceſs*, or *defect* in their *nouriſhment*. Thus have I ſeen the *ſtalks* of *Dyers-weed* and *Succory*, from a round near the *root*, ſpread themſelves upward into a *broad flat* ſtalk, as if there were ſeveral of them *faſciated* together, occaſioned I ſuppoſe by reaſon of the aſcent of *to much* nouriſhment for one ſtalk, and yet not *enough* for two. The *faſciation* (if I may be allowed to coyn ſuch a word) being as it were an attempt for *two* ſtalks, which upon the aſcent of ſufficient *ſap*, is ſomtimes accompliſh'd, the flat ſtalk then dividing into *two*, as I obſerved it this Summer in a *Draba lutea ſiliquis ſtrictiſſimis*, and ſeveral other *Plants* in the Gardens.

16. Which *accident* of *Plants* the *German Virtuoſi* think only to happen after hard and late *Winters* [d], by reaſon whereof indeed the *ſap* being reſtrained ſomwhat longer than ordinary, up-

[z] *Horti Eyſtett. Plant. Vernal. Ord. 9. fol. 5.* [a] *Valer. Cordi Hiſt. de Plant. lib. 2. cap. 107.* [b] Joh. Thalii, *Hercynia Saxono-Thuringica, p. 13.* [c] *In Catalog. Plant. Angl.* [d] *Miſcellan. curioſa Med. Phyſ. Acad. Nat. Curioſorum, An. 1. obſerv. 102.*

on

on ſudden thaws, may probably be ſent up more *forcibly* and *together*, and ſo produce theſe *faſciated* ſtalks; whereas the *natural* and *graduated* aſcent would have produced them but ſingle. Yet experience has taught us this preſent year 1676. that ſuch productions muſt by no means be thus reſtrained; the *Winter* preceding, in *Anno* 1675. being one of the mildeſt ever known in *England*, and yet *faſciated Plants* as frequent as ever.

17. Beſide *thoſe*, we have obſerved ſome *others* here curiouſly ſtriped; ſome of them *yellow*, as *Dens Leonis*, *Caryophyllata*, *Urtica urens*, *&c.* others *white*, as *Papaver ſpumeum*, *Plantago quinque nervia*, *Cruciata*, *Calamintha aquatica*, *&c.* *Others* again differing from the reſt of their kind, not in *leaves*, but colour of their *flowers*; ſuch are *Lamium rubrum*, *Lyſimachia ſiliquoſa magno flore*, *Trachelium minus*, *Gentianella fugax minor*, *Anagallis terreſtris*, *& aquatica ſive Becabunga*, *cum multis aliis*, all with *white* flowers; and *Hyacinths*, we have ſomtimes found with *red*, and *white* flowers: All which, I gueſs *accidentally* accrew to theſe *Plants* (their *ſpecies*'s having flowers of different colours) through *defect*, or ſome *interception* of their nouriſhment, which occaſion *diſeaſes*, and ſuch *diſcolorations* both in their leaves and flowers.

18. That this is true of all *ſtriped Plants*, is manifeſt, in that ſuch *diſcolorations* may be procured by *artificial* ſubſtraction of the nouriſhment, *viz.* by applying *Lime*, or other hot dry matter to their *roots*; which drying up, or otherwiſe rendring the *nouriſhment* unfit, will thus make the *Plants ſtriped*; as our very Learned *Botanic Profeſſor*, Dr. *Moriſon*, informs us he obſerved it in *Dulcamara* creeping through *Lime* and other rubbiſh of Buildings, at the *Duke* of *Orleans* his Houſe at *Blois*, whence not only *ours*, but moſt other *Gardens* of *Europe* have ſince been ſupplyed with the *white ſtriped Dulcamara*.

19. Moreover, that ſnch *ſtripings* are nothing but *diſeaſe*, appears plainly in that moſt, if not all *ſtriped Plants*, are ſomwhat *deformed* and *imperfect* in their leaves; and though *ſtriped* very lively in the beginning of the *Spring*, will many of them recover in ſome meaſure, at leaſt before *Autumn*, and ſome of them have their leaves at length as *green*, as the reſt of the healthy Plants of their *kind*: Which I take to be manifeſt arguments of their *ſickneſs*, and ſuch *ſtripings* to be only *diſcolorations*, and no ornaments of perfection, though ornaments of our *Gardens*.

20. To

20. To which if it be objected that 'tis otherwiſe in the *Flowers* of all the *Plants* above-mentioned, which though of different *colours* from the reſt of their *ſpecies*, continue ſo ſtill from year to year, not altering in the *Autumn* from what they were ith' *Spring*: It muſt be anſwer'd, that notwithſtanding what is urged be true, yet ſuch conſtancy will not warrant them of a different *ſpecies*, ſince no *ſeed* they produce will bring more of their *kind*, but only ſuch whoſe *flowers* will be of the ordinary *colour*; which is ſo great an imperfection, that we cannot but ſuſpect theſe alſo to be *diſeaſed*, and to have their variations only from thence.

21. Though it muſt be confeſt, that it's worthy notice too, that many of theſe *Plants* ſeem as ſtrong, and flouriſh as well as any *others*, and produce perhaps their Seed as perfect as *any*: Why then they ſhould be numbred amongſt diſeaſed *plants*, any more than a *red hair'd* man ſhould be accounted ſo in *England*, or a *black hair'd* one in *Denmark* (where I am informed there are ſo few, that they commonly paint *Judas* with *black hair* as we do with *red*) is a difficulty, I gueſs, not eaſily avoided; eſpecially ſince the difference of *colours* in *flowers* may be occaſioned by the different textures of the ſtalks of ſome certain *plants*, as it is in the hair and feathers of *Animals*, alſo of different colours from the reſt of their *ſpecies*, as ſhall be fully made out in the following *Chapter*. It may therefore perhaps be more ſafely concluded, that the different *colorations* at leaſt of ſome of theſe *flowers*, may indeed be *accidents*, but no *accidents* of diſeaſe or imperfection.

22. Which is all I have met with concerning wild *herbaceous Plants*, and the *accidents* attending *them* remarkable in this *County*, in the relation whereof I have been all along ſo careful of not impoſing on the *World*, that I have mention'd nothing, except in the *Philoſophical* part, wherein I have not conſulted, and had the approbation of ſome of the moſt knowing in the *Faculty*, ſuch as the Reverend *William Brown* B. D. and Fellow of *Magdalen College Oxon*, *Edward Tyſon* M. A. *John Baniſter* M. A. *Richard Stapley* B. A. and Mr. *Jacob Bobart junior*, all eminent *Botaniſts*.

23. Of *unuſual Plants* now cultivated in the *Fields*, to paſs by the ordinary red and white *Lammas Wheats*, black and white *Ryes*, the

the common *Barley*, *Peas*, *Beans*, and *Oats*, there are ſeveral worthy notice now ſown in this *County*, that have been ſcarce ever heard of, much leſs uſed in ſome *others*: Where by the way let it be noted, that the word [*unuſual*] is not ſo much to be applyed to *this*, as other *Counties*, and that in theſe matters of *Huſbandry*, I rather write for the information of *ſtrangers*, than the *inhabitants* of *Oxford-ſhire*, as I muſt hereafter in other *Counties* for the information of *this*: There being many things in each *County* thought common there and unworthy notice, that perhaps in ſome *others* will appear ſo ſtrange, that they will ſcarcely be believed. And ſuch are

24. *Triticum ſpicâ muticâ rubrum, caule item rubro*; red ſtalkt *wheat* (miſtaken by many for red *Lammas*) ſo commonly called from the redneſs of its *ſtraw*, eſpecially near the *joints* when the *Corn* begins to turn; which redneſs yet will vaniſh for the moſt part away, when it is full ripe. This *Corn*, as I was inform'd, was firſt propagated from ſome few *ears* of it pickt out of many *Acres*, by one *Pepart* near *Dunſtable*, about fifty years ago, which ſowed by it ſelf till it amounted to a quantity, and then proving *Mercatable*, is now become one of the commoneſt *grains* of this *County*, eſpecially about *Oxford*; which yet becauſe not known in many other *places*, I thought fit at leaſt to mention it, and the rather becauſe of its ſeldom or never *ſmutting*, a conveniency that pleaſes the *Baker* and *Husbandman* both; and yet it ſeems 'tis not now ſown about *Thame* and *Watlington* ſo much as formerly, becauſe it brings not ſo certain, nor ſo good a burthen as

25. *Triticum ſpicâ muticâ albicante, granis rufeſcentibus*, white eared red *wheat*, white *Corn*, or mixt *Lammas*, which latter name I take to be as agreeable as any, becauſe of its participating both of the white and red *Lammas*, having a white *ear* and red *grain*; whereas the white *Lammas* has both *ears* and *grain* white, and the red *Lammas* both red: Nor has this, as I was told, been long in *Oxford-ſhire*, it being firſt advanced like the former from ſome few *ears*, and at laſt being found to yield conſiderably better than moſt other *wheat*, *viz.* ſomtimes *twenty for one*, it is now become the moſt eligible *Corn*, all along the *Vale* under the *Chiltern* Hills, and in far better eſteem than the red ſtalk'd *wheat*, or,

26. *Tri-*

26. *Triticum ſpicâ ariſtatâ glumis hirſutis*, the long *Cone* Wheat, which yet is the beſt of any, to be ſown in *rank clay* Land, its *ſtalks* being reedy and not ſubject to lodging; and by *hedges* ſides, becauſe the Birds cannot eat it; for which reaſon alſo it muſt be good in *Incloſures*, beſides its being the leaſt ſubject of any *Corn* yet known, to the inconveniency of *Mildews*: This *ſort* alſo yields extreamly well, but its *Flower* being courſe and not pleaſing the *Bakers*, it is ſeldom ſown but under the mentioned circumſtances, except ſomtimes mixt amongſt the other *wheats*.

27. *Triticum multiplex, ſive ſpicâ multiplici*, double ear'd *wheat*, ſo named for that it has divers *ſmall ears* iſſuing out of the ſides of the *greater*, and is ſown about *Biſſiter* and *Weſton on the Green*, but it not proving agreeable to the *ſoils* thereabout, nor advantagious to the *Husbandman*, it is almoſt quite diſuſed, though I hear it ſucceeds better about *Fritwell* and *Souldern*. They ſow alſo a Wheat about *Weſton on the Green*, which from the hanging of its *ear* they call *Pendule* wheat, but ſuſpecting that it differs in nothing from *Cone*, it being *ariſtis munitum*, and *glumis hirſutis*, I forbear as yet to pronounce it any *other*, though I am told that the *Pendule* has a redder and more ſlender, and *Cone* a whiter and fuller *ear*; and that *Cone* endures longer, and *Pendule* but a very ſhort time here, it yielding for the firſt year ſomtimes *twenty for one*, and within two years after dwindling away, ſo as not to be worth ſowing; which time expiring, they ſupply themſelves again out of *Berks-ſhire*, at *Abington Mercat*, whereof more (if I find it to be a different *kind*) when I come into that *County*.

28. All which, 'tis true, in *Oxford-ſhire* are ſo commonly ſown, that they cannot indeed in this reſpect be ſtiled *unuſual*: but becauſe ſcarce ever heard of in the *South-eaſt* parts of *England*, I thought it convenient at leaſt to hint *them*. And ſo likewiſe our

29. *Hordeum diſtichum præcox*, or rathe ripe *Barly*, deſervedly ſo called from its early ripening, it having been ſomtimes ſown and returned to the *Barn* again in two *months* time, and often in nine or ten *weeks*. This *Barly*, 'tis true, is no native of *Oxford-ſhire*, only much ſown here, it being all had either immediatly or mediatly from *Patney* in *Wiltſhire*, whence by ſome 'tis alſo called *Patney Barley*: Where the ſoil (as I am told) is of ſo peculiar

culiar a quality, that what-ever other *Barly* is ſown there, it is turned forthwith into this we call *rathe-ripe*; a feat, which they ſay, no other *Land* will perform. But we are told by Dr. *Childrey*[c], that in the weſtern parts of *Cornwall*, they ſow a ſort of *Barly* near the Sea-ſide, which they carry to *Mill* in eight or nine *weeks* time after they have ſowed it. However, what we have here comes all from *Patney*, but is not ſo agreeable to our *Oxford-ſhire* ſoil immediatly from thence, as when it has been ſown elſewhere twice or thrice; after which, it endures not above three or four *years*, but degenerates again into common *Barly*. Its *conveniency* notwithſtanding is very *conſiderable* in wet and backward *Springs*, and moiſt *Autumns*, when many other *Countrys* loſe their *ſeaſons*, and ſome of the more *Northern ones* perhaps their *crop*, the common Barly there never coming to be *ripe*, whereas this may be ſown at the latter end of *May*, and will come to be ripe in the worſt of *Summers*. This I heard of firſt at *Gaunt-houſe*, (the Paternal Eſtate of the *Right Reverend Father in God*, John *Lord Biſhop of* Oxon, one of the *Nobleſt Encouragers* of this *Deſign*) but met with it after all over the *County*, it being generally approved of by all ſorts of *Huſbandmen*. And this is the only Barly ſown in this County unknown in ſome others.

30. But of *Peas* there are many *ſorts* little thought of *Southward*, that poſſibly were they known, might prove as agreeable to the *ſoils* there, as here, and as advantagious to the *Husbandman*. Such are the *Peas* called *Henly-gray*, and another ſort called *Red-ſhanks*, for freſh *new broken* Land; the *Vale-gray* for *ſtrong*; and *Hampſhire-Kids* for *new chalkt* Land; the ſmall *Rathe-ripes*, for *poor* and *gravelly*; and the *Cotſwold* Pea for *ſour ground*. And of *Vetches*; in deep clay Lands they ſow the *Gore* and *pebble-Vetch*; in cold moiſt grounds the *rathe-ripe Vetch*; and *Dill* or *Lentills*, in poor *ſtone-braſh* land, which are a good *podware* for *cattle*, and ſown in many parts of the *County*.

31. As for *Beans* and *Oats*, they ſow only the common that are every where elſe; but for *Graſſes*, the uſual name for any *Herbage* ſown for Cattle, eſpecially if *perennial* (to paſs by the *trifolium purpureum majus ſive ſativum*, *Clover-graſs*; and *Onobrychis ſpicata flore purpureo*, *ſemine echinato*, commonly called *Sainct-foin*,

[c] *Britannia Baconica* in *Cornwall*.

or *Everlasting-grass*; but according to Dr. *Morison*, the true *Lucern*, now every where known, and therefore nothing concerning the qualities and advantages of *it*.) They have lately sown *Ray-grass*, or the *Gramen Loliaceum*, by which they improve any *cold, sour, clay-weeping* ground, for which it is best, but good also for dryer *up-land* grounds, especially *light stony*, or *sandy* Land, which is unfit for *Saint-foin*.

32. It was first sown (as I was told) in the *Chiltern* parts of *Oxford-shire*, and since brought nearer *Oxford* by one Mr *Eustace*, an ingenious Husband-man of *Islip*, who though at first laught at, has been since followed even by *those* very persons that scorn'd his *Experiment*, it having precedence of all other *grasses*, in that it takes almost in all sorts of *poor* Land, endures the *drought* of *Summer* best, and in the *Spring* is the earlyest grass of any, and cannot at that time be over-stock'd; its being kept down making it sweeter, and better beloved by *Cattle* than any other grass: Nay, sometimes they have been known to leave *Meddow hay* to feed on *this*: but of all other *Cattle* it is best for *Horses*, it being hard Hay; and for *Sheep*, if unsound, it having been known by experience to have work'd good *cures* on *them*, and in other respects the best *Winter* grass that grows.

33. As to the *manure* of it, some sow but two *bushels* on the *Statute* Acre, but 'tis best to sow three, mixt with the *trifolium agrarium Dodonæi*, called *Melilot-trefoil*, and sometimes *Non-such*, because of it self it is but a thin spiry *grass*, and will not be of any bulk the first year, unless thickned by the *Trefoil*, which failing by degrees, the *Ray* or *bennet-grass* (so some also call it) thickens upon it, and lasts for ever. Of *Ray-grass* and *Trefoil* thus mix'd together, one at *Islip* but lately had so advantagious a *crop*, that from four *Statute* Acres, worth not above *forty shillings per annum*; beside the keeping six or eight *cattle* till *holy Thursday*, and the feeding all the *Winter* following, had twenty Quarters of Seed worth twenty pounds, and fourteen loads of *fodder*, enough to winter five or six *cattle*.

34. The *fænum Burgundiacum cæruleum L'Obelii*, or *Medica legitima Clusii & Dodonæi*, commonly called *Lucern*, but by the Learned Dr. *Morison* said to be the true *Saint-foin*, is also sown here, and found to agree well enough with a *rich moist* ground, but better by much in a *warm* and *dry* soil. This stands recommended for

for an excellent *fodder* both by Men and Beasts, especially *Horses*, which are purged, and made fat with it in the *Spring* time in 8 or 10 days. But no more of this, or any other *grasses*, they having all (but *Ray-grass*) been already described.

35. But beside Grasses, there have some other *Plants* been cultivated here of no mean use, such as *Cnicus, sive Carthamus sativus*, manured *bastard Saffron*, somtimes called *Safflore*, for dying of *scarlets*; and therefore by some called also the *scarlet Flower*, whereof there was once a considerable quantity sown at *North-Aston* by Colonel *Vernon*, the Seeds being planted in rows about a foot distant, for the more convenient howing and keeping it clean from *weeds*: In these rows *it* rises with a strong round stalk three or four foot high, branching *it self* to the top, where it bears a great open skaly head, out of which *it* thrusts forth many gold yellow threds of a most *orient* and shining colour, which they gather every day as fast as they ripen, and dry them well; which done, it is fit for sale, and dying of *scarlet*.

36. And about *Hampton* and *Clanfield*, they make some profit of sowing *Carum sive Careum*, or the *Carui of the shops*, commonly called *Caruwaies*, which they sow in *March* or *April*, as they do *Parsly*; the first year (it seems) it bears no Seed, but the next it seeds and shatters, and so will hold six or seven years without new sowing, or any other care or trouble, beside keeping it from weeds: the encouragement they have to sow it, is the value put on it; one pound of this being esteemed by the *Grocers*, worth almost two of that which they have from *London*.

37. And this is all I have met with concerning *cultivated plants* worthy taking notice of in this County, but that like the wild *Indigenous ones*, these have somtimes accidents that attend them too: for such, and no other, were the *two ears* of *Wheat* branched from one stalk, and *six ears* of *barley* from another, found at *Fulbrook* near *Burford*, and given me by Mr. *Jourden*, since deceased. Nor have I more to add concerning them, but that I find few that I have mentioned to be noted by Mr. *Ray*.

38. Next *Herbaceous plants*, I proceed to the *Shrubs*, amongst which I met with but little extraordinary, only the *Haw-thorn* at *Bampton*, in the *bowling-green hedge*, bearing *white berries* or *haws*, which indeed I take to be a great *curiosity*: for though in Flowers

and Animals, *white* be esteemed by some a *penurious* colour, and a certain indication of a scarcity of *nourishment*: Whence 'tis, says my Lord *Verulam*[f], that blue *Violets* and other *Flowers*, if they be starved, turn *pale* and *white*; *Birds* and *Horses* by age turn *white*; and the hoary hairs of *men* come by the same reason. And though among *Fruits* the *white* for the most part argues but a mean *concoction*, they being generally of a *flashy over-watery* taste, as *Pear-plums*, the *white-harvest plum*, *white Bullets*, *&c*[g]. and divers sorts of *pears* and *apples* of that colour. Yet in *Berries* the case seems to be quite different, as we see in *Gooseberries*, *Grapes*, *Straw-berries*, *Rasps*, whereof the *white* are by much the more delicate, and have the better *flavor*; which if true, in the whole *species* of *berry-bearing* Plants (as in probability it may) we have reason to conclude that the *berries* of this *Thorn* are not accidentally *white*, through *defect* or *disease* as in some other Plants, but that they are an argument of its perfection, and that the Thorn it self is of a quite different *species* from all known before, and may justly challenge the name of *Oxyacanthus baccis albis*. These Berries 'tis true, I saw not my self, not being there in time of year for them, but being certified of the truth of it by the common voice of the Parish, and particularly by the Worshipful *Thomas Hoard* Esq; who first told me of it, and the Reverend Mr. *Philips* Arch-Deacon of *Salop*, and one of the three *Vicars* there; (men of great ingenuity and undoubted veracity) I had no reason to question the certainty of the thing.

39. And hither I think may be referred the *Glastenbury Thorn*, in the Park and Gardens of the Right Honorable the Lord *Norreys*, that constantly buds, and sometimes blossoms at or near *Christmass*: Whether this be a Plant originally of *Oxford-shire*, or brought hither from beyond Seas, or a graft of the old stock of *Glastonbury*, is not easie to determin. But thus much may be said in behalf of *Oxford-shire*, that there is one of them here so old, that it is now dying, and that if ever it were transplanted hither, it is far beyond the memory of *men*.

40. As for the excellent and peculiar quality that it hath, some take it as a miraculous remembrance of the Birth of *CHRIST*, first planted by *Joseph* of *Arimathea*; Others only esteem it as an earlier sort of *Thorn* peculiar to *England*: And others again are of

[f] *Nat. Hist. Cent.* 1. *Num.* 93. [g] Here except the *Pardegwin* and white *Damasin*.

opinion

opinion, that it is originally a foreigner of ſome of the *ſouthern* Countries, and ſo hardy a Plant, that it ſtill keeps its time of bloſſoming (which in its own *Country* might be about the end of *December*) though removed hither into a much colder *Climat*. Whether of theſe is moſt probable, I ſhall not determin, but leave every *Reader* beſt to pleaſe himſelf; and whatever more can be ſaid of it, I ſhall reſerve till I come into *Somerſet-ſhire*, where it is in greateſt reputation, and has been moſt obſerved.

41. Whereunto perhaps may be added a kind of *Roſa Canina*, which we have ventured to ſtile, *humilior fructu rotundiori*, for that it wants much of the height and ſtrength of the common *one*, and has round *leaves*, and the *hips* compreſſed at the top, and branches thick ſet with ſmall *prickles* between the great *ones*; whereas the common one has both *leaves* and *hips* long and pointed, and only a larger ſort of *prickles* ſet at ſome diſtance: But whether this be not the *roſa ſylveſtris folio glabro, flore plane albo*, of *John Bauhin*, to w^ch we find it moſt agreeable of any deſcribed *, we dare not pronounce; and therefore have not ventured to give it any *draught*, but have left it to further enquiry, which that all men may readily make, they may find it growing plentifully in *Magdalene College* water-walks; in the way up *Heddington*-hill; and in many other places near about *Oxford*. And if judged at length to be that of *John Bauhin*: however, we find it not noted by Mr. *Ray*, and therefore cannot be guilty of miſplacing it here.

42. Beſide this, I met with no *others* either dubious or omitted, but ſeveral of them diſeaſed, diſcoloured or ſtriped; ſuch as *Periclymenum ſylveſtre* (with the more accurate *Botaniſts*, rather a *ſubfrutex* than a *ſhrub*) found at *Shotover*-hill; *Cornus fœmina* at *Waterſtock*; *Rubus major vulgaris*, in the Lane between *Finſtock* and *Fawler*; and *Sambucus vulgaris*, in the hedges at *Cowley*, and near to *Oxford*; all which are ſtriped yellow, but the *laſt* ſomwhat more remarkably than any of the former, the *veins* only being yellow, and all the *parenchymous* part of the leaf remaining green, ſo that the *ſtriping* repreſents as it were a *Net-work*: but this alſo growing out after ſome time like the reſt, muſt be reputed of the ſame kind, and to proceed from the ſame cauſe. Which is all I have found obſervable under the *Species* of *ſhrubs*, except it be worthy notice, that in the *Chiltern* part of *Oxford-*

* *Hiſt. Plant. lib.* 14. *cap.* 1.

cantha,

ſhire the *Rubus Idæus*, Framboiſe, or Raſp-berry buſh, grows plentifully enough among the woods and hills: and the *Oxyacantha*, or Barberry-buſh, between *Upper* and *Nether Kiddington*.

43. Thus having diſpatch'd both *Herbs* and *Shrubs*, I come at length to the *Trees*, whereof I have met with but *one* undeſcribed, and that a *narrow leaved Elm*, which alſo being *ſmooth*, juſtly deſerves the name of *Ulmus folio anguſto glabro*, wherein it differs not only from the *Ulmus minor* of *Parkinſon* and *Gerard*, but alſo from their *Ulmus folio glabro*, whoſe Leaves they ſay are nothing ſo large as the *Wych Haſel*, but neareſt in bigneſs, and exactly in the figure of the *common Elm*; whereas ours are much *leſs*, and of a quite different *figure*; being narrow, and having a peculiar kind of pointed ending, as exactly expreſſed in *Tab.* 10. *Fig.* 1. Of thoſe there are plenty in the *Avenues* to the Houſe of the Honorable the Lady *Cope*, the Relict of the moſt Ingenious Sir *Anthony Cope* of *Hanwell*, where there is a whole Walk of them planted in order, beſide others that grow wild in the *Coppices* of the *Park*.

44. As for *Trees* either not noted, or any way doubted, I have met with none here: but of *Trees* remarkable for ſome unuſual accident attending them, there are ſeveral worthy notice. For of *Oaks*, though I found none ſo prodigious as ſome mention'd by the Learned and Ingenious *John Evelyn* Eſq; in his diſcourſe of *Forreſt Trees* [h]; yet there is one between *Nuneham-Courtney* and *Clifton*, that ſpreads from boughs end to boughs end, 81 foot, in circumference ſuppoſing the boughs to ſpread uniformly 243, ſhading 560 ſquare yards of ground; under which allowing three ſquare yards for a *horſe* or other *beaſt*, and two ſquare feet for a *man*; 186 of the *former*, and 2420 of the *latter*, may be ſhelter'd from the injuries either of *ſun* or *rain*.

45. Yet there is a ſomwhat bigger *Oak* than that, at *Magdalen College*, near the Gate of the *Water-walks*, whoſe boughs ſhoot from the boal fifteen or ſixteen yards, which ſuppoſing they did ſpread of equal length from the trunk, like the *rays* of a *circle*; the content of ground on which it would drop, would be no leſs than 768 ſquare yards, whereof allowing as before, three ſquare yards of ground for a *horſe* to ſtand on (three yards long, and one yard broad, ſeeming a competent proportion) there might

h Diſcourſe of Forreſt Trees, *cap.* 30.

256 *horſes*

256 *horſes* ſtand under that *Tree*; or allowing as before 2 ſquare feet for a *man*, 3456 *men*.

46. Yet at *Ricot*, in the Park of the Right Honorable the Lord *Norreys*, there is an *Oak* yet ſomwhat bigger then either of the former, by the *Author* of *Dodona's Grove*, called his *Robur Britannicum*, which extendeth its branches from the trunk of the *Tree* about 18 yards, ſo that the diameter of its circumference being 36 yards, it takes within its *Area* 972 ſquare yards; under the umbrage of which *Tree*, upon the afore-mentioned proportions, no leſs than 324 *horſes*, or 4374 *men*, may ſufficiently be ſhelter'd.

47. And theſe are the *Trees* moſt capacious without; ſome *others* there are that have given ſhelter within the hollow of their trunks: Mr. *Evelyn* tells us of *one*, ſomwhere in *Glocester-ſhire*, that contains within its bowels a prety wainſcoted Room, enlighten'd with windows, and furniſh'd with ſeats, *&c.* which I ſuppoſe may have given reception to many an honeſt *Gentleman*. Now though 'tis true we have none put to ſo Honorable a uſe, yet the hollow *Oak* on *Kidlington*-green, for the neceſſary and publick ſervice it has done, ought perhaps to have preference, though neither ſo great nor gaudy; it being frequently uſed before the death of Judge *Morton* (before whoſe Houſe it ſtood) for the Impriſoning *Vagabonds* and other inferior *Malefactors*, for the ſpace of a night or ſo, till they conveniently might be had to the *Goal* at *Oxford*: Of whom, the hollow is ſo large within, that it would receive eight or ten commodiouſly enough, the *Tree* without being 25 foot round above the *ſpurs*.

48. Juſt ſuch another *Priſon* as this, as we are informed by *Johan. Ferdinand Hertoda* [i], was made in *Moravia*, in the trunk of a *Willow* 27 foot round, in the Village of *Moravan*, by a certain Judge of that Country: The extravagant growth of which *Tree*, he attributes to the fertility of the whole *Marquiſate*; whereas I rather think (not but that the Country may be fertile enough) the extream rank growth of that, and of all other *Plants* ſo exceeding the ordinary courſe of *Nature*, ought rather to be imputed to ſome more peculiar agreeableneſs of the reſpective ſoils and *Plants*, than is ordinarily met with in any other places of the ſame *Country* where-ever it be.

[i] *Tartaro-maſtigis Moraviæ, part.* 1. *cap.* 17.

49. On

49. On *Blechington*-green, near the *Angel* and *Crown* Inn, there is alſo an *Elm* of ſo capacious a hollow trunk, that it once gave reception to a poor great-bellyed woman (excluded all the houſes in the *Pariſh*, to prevent her bringing a charge on it) who was brought to bed in it of a Son, now a luſty *young man*, and living, as they told me, at or near *Harwich*. And yet neither this *Elm*, nor the afore-mentioned *Oak*, are either of them ſo big, but that they may be match'd in many other places, in ſo much that I ſhould ſcarce have thought them worthy my notice, had it not been for the *ſtrange uſes* they were heretofore put to.

50. And thus I had immediatly paſſed on to *Elms*, but that I am detained by a parcel of *ſubterraneous Oaks*, found ſome years ſince at the bottom of a Pond on *Binfield-heath* in the Pariſh of *Shiplake*, very firm and ſound, but quite through to the heart as black as *Ebony*; cauſed I ſuppoſe by a *Vitriolic* humor in the *Earth*, which joining with *Oak* the parent of a ſort of *Galls*, might reaſonably enough produce ſuch an *effect*, as we ſee they do always in the making of *Ink*: And that I am not miſtaken in this conjecture, the Ditches by the Woods ſide between this and *Caverſham* will bear me witneſs, the Waters whereof, where they ſtand under *Oaks* and receive their dropings and fall of their leaves, being turned blacker than any *Vitriolic ones* I have any where ſeen, except thoſe of Mr. *Tyrrill* of *Oakley* in *Buckinghamſhire*.

51. And *theſe* alſo no queſtion performed the ſame *feat* to ſome Tuns of *Oak* found alſo under a *Pond*, belonging to the Worſhipful *Thomas Stonor* Eſq; of *Watlington-Park*, near *Blunds Court*, in the Pariſh of *Rotherfield Pypard*, which for the benefit of the ſoil, and other conveniencies, being cleanſed in *July*, *Anno* 1675. the Work-men ſinking it a convenient depth, came at laſt, as it proved, to the top Branches of an *Oak*: relation whereof being made to the *owner* the worthy Mr. *Stoner*, a perſon not only curious, but equally generous; he preſently gave order for a further inquiſition, and accordingly employed an equal number of *men* to the greatneſs of the work, who ſinking a *pit* about twenty yards over, and about fifty or ſixty foot deep, found many whole *Oaks*; whereof one ſtood upright perpendicular to the *Horizon*, the others lay obliquely, onely one was inverted, the forked

forked end downward: All of them *dyed* through of a black hiew like *Ebony*, yet much of the Timber ſound enough, and fit for many uſes, ſeveral of the *Trees* being a foot or fourteen inches, and particularly one above three foot *diameter*, and all receiving a very good poliſh; and therefore fitter for *Joyners* in-laid works, than *pales* to ſet about cloſes, to which uſe that was put, which was found at *Binfield*.

52. Beſide the *Trees*, all along as they dug, they met with plenty of *Haſel-nuts* from within a yard of the ſurface to the bottom of the *pit*, which Times iron teeth had not yet crack'd; and that which amazed me moſt of all, I think they lay thicker than ever they grew: Some of which, as well as the *Oaks* were at ſome places cover'd with a *bluiſh ſubſtance*, much of the conſiſtence of the flower of *Sulphur*, and not much unlike to the fineſt *blue ſtarch*; which is the *Cæruleum nativum* before mentioned in this *Hiſtory*, *Cap.* 3. *Sect.* 18. The *Oaks* had none of them any *roots*, but plainly cut off at the *kerf*, as is uſed in felling *Timber*; The ſhells of the *Nuts* very firm without, but nothing remained within of the *Kernel*, but a ſhew of the dry outer rind. And the *blue ſubſtance* not found only upon the *Nuts* and *Oaks*, but in any other ſmall cavities of the *Earth*, diſperſedly here and there all over the *pit*.

53. Moreover, there was found a ſort of *white ſtone* diſperſed in like manner, in pieces ſomtimes as big as ones fiſt, in colour ſomwhat like to white *Marble* or *Alabaſter*, but of a much different texture. And near the bottom of the pit a large *Stags head*, with the *Brow-antliers*, as found as the *Beam* it ſelf, with two *Roman Urns*, both which were broken by the incurious Workmen.

54. How the *Timber* ſhould be thus *dyed* as black as *Ebony*, I hope I have made no improbable conjecture, nor is it liable that I know of to any exception, unleſs to a *Quære*: Why the *Nuts* and *Stags head* were not dyed ſo too? To which it may be anſwered, That the pores of the ſhells being cloſer than the wood, and neither the *nuts* nor the *horn* having any thing *galliſh*, the *Vitriol* of the Earth could have no power on them, whether it be wrought by repugnancy or combination, to work that effect.

55. But how the *Timber* ſhould become thus buryed both

at *Binfield* and *Blunds Court*? and at the latter how joyned in ſo ſtrange a mixture, as *Haſel-nuts*, a *Stags head*, and *Urns*; and at ſom places only, with an *Alabaſtrine* kind of ſubſtance? remains yet a knot not ſo eaſily looſed. However, ſince attemts have ſomtimes pleaſed, and it has always been acceptable *in magnis voluiſſe*, I ſhall adventure to propound my preſent thoughts; ſtill reſerving the liberty to my *ſelf*, as well as *Reader*, of thinking otherwiſe when ſufficient grounds of change ſhall offer themſelves at any time hereafter.

56. Firſt then, as for the *timber* dug at *Binfield*-heath, 'tis likely that might be fell'd and buryed there when *Societies* of *men* (which I gueſs was not common till the days of King *Alfred*) under ſome *Mean*, or *Lord Paramount*, firſt choſe to themſelves certain places of aboad, and promoted *Agriculture*: which that they might the better do, they fell'd and buryed the *timber* which they could not well burn with the *under-wood*. Thus, as I have been informed by a very worthy Perſon, who had it from his aged *Father*, did our *Grand-fathers* ſerve their *timber* in the inland parts of *Kent* to make room for *tillage*, digging a trench by each *tree* after it was fell'd, and ſo tumbling it in, its ſale not being worth the portage, even there, ſo few years ago. Much rather therefore might the firſt *Planters* of *Binfield*-heath throw it into Ponds, or other hollow places ready at hand, to make room as well for *habitation* as *tillage*, in ancienter times: which I gueſs might be done in the Reign of King *Alfred*, 1. becauſe he divided the *Kingdom* into *Shires* and *Hundreds*; and 2. becauſe *Binfield* gives name to the *Hundred* (however inconſiderable it be now) in this woody part of the *County*.

57. Moreover, that this *Timber* muſt be buryed by deſign, and not caſually over-thrown, either by their *roots* being looſen'd by to much wet, occaſioned by the obſtruction of *Rivers*, as *Camden* [k] apprehends thoſe *Trees* were, found in *Chatmoſs* in *Lancaſhire*: Nor by the over-flowing of any *Rivers*, nor fall of any *Torrent*, as *Steno* would have it [l]: Nor undermined by *ſubterraneous ſtreams*, or diſſolution of matter underneath them, as Dr. *Jackſon* [m] thinks it happened about 18 years ſince at *Bilkely* in *Hereford-ſhire*, is plain and evident; for that all the *Country* here-

[k] *Camden* in *Lancaſhire*. [l] *Steno in Prodrom.* concerning the matter of beds. [m] Philoſoph. Tranſact. *Num.* 53.

about

about lies very high, and is as ſtony a faſt ground, as almoſt any where to be found.

58. It remains therefore, that it muſt needs be deſignedly buried, and if in any other places of the *heath*, as well as in the *pond*, may poſſibly be diſcover'd either by the *herbage* over them, which will wither much ſooner than any of the reſt; as near *Yeovil* in *Somerſet-ſhire*, where, as we are informed by the Reverend and Learned Dr. *Beal*[n], the parched part juſt over them, will bear the very length and ſhape in groſs of the *trees*, whence they have been inſtructed to find and take up hundreds of *Oaks*: Or by the direction of the *dew* in Summer; it being obſerved in *Cumberland*[o], that the *dew* never ſtands on any of the ground under which ſuch *trees* lie; though poſſibly too, on the other ſide we may have no ſuch *indications* here in firm grounds, they being hitherto obſerved only in *moors* and *moſſes*.

59. But as for the *timber* at *Blunds Court*, as it was found, ſo it requires a deeper reſearch, it being very unlikely they ſhould dig ſo low, upon the ſame ſcore as at *Binfield*, ſince *timber* might have been buryed on far eaſier terms, as formerly in *Kent*. Much leſs can it be admitted it ſhould be ſwallowed by an Earth-quake, or as the *vulgar* will needs have it, thus cover'd with Earth by the violence of a *Flood*, and particularly by that in the days of *Noah*. For in either of thoſe caſes, we ſhould have found each *tree* with *roots* as well as *branches*, whereas theſe were plainly hewen off at the *Kerf*, as is uſed in felling *Timber*, the marks of the *Ax* ſtill remaining upon them.

60. Beſide, the ſeveral other *things* found in company of theſe *trees*, ſeem to give teſtimony of ſome other *matters*. The firſt and chiefeſt whereof, is that blewiſh kind of ſubſtance, which I am ſtrongly perſwaded is *Cæruleum nativum*, and the rather, becauſe found in an *Aſh-colour'd* Earth. The true *Cyprian Cæruleum*, or *Ultramarine*, as is teſtified by *Rulandus*, being found in *terra cinereâ*; and the *Cæruleum Patavinum*, in *glebis ſubcinereis*[p]; with whom agrees *Kentmannus*, as cited above, Chap. 3. §. 18. And if true *Cæruleum*, we have reaſon to ſuſpect a *Mine* underneath; for then, ſays *Aldrovandus*, is *Cæruleum* produced, when ſome ſaline acid humor (ſuch as the *Vitriol* that dies the *Trees*

[n] Philoſoph. Tranſact. *Numb.* 18. [o] *Britannia Baconica* in *Cumberland*. [p] *Mart. Ruland. Lexic. Alchemiæ.*

black) corrodes ſome *metallick* matter or other [q]; which ſomtimes is *Copper*, and ſomtimes *Gold*, as *Encelius* witneſſeth it is at *Lauterberg* and *Goldeberg* in *Sileſia*, in his Book *De re Metallica* [r]; where he alſo further adds, that *Gold* is ſmelted out of *Cæruleum* it ſelf.

61. Dr. *Brown* alſo tells us, in the account of his Journey from *Comara* to the Mine-Towns in *Hungary* [s], that at *Schemnitz*, where the *ſilver* Ore holds ſome *gold*, and at the *ſilver* Mines in *Peru*, there are Rocks cover'd over with a fair ſhining blue. *Rulandus* [t] alſo joins it with a *ſilver* Ore at *Gieſhubelia*, and ſo does *Pliny* [u]: What then ſhould hinder but it may be ſo here? ſince I do not doubt it to be the ſteam of a *mineral*; for when I was at the bottom of the *pit* (above 50 foot deep) notwithſtanding the openneſs of the *pit*, and coolneſs of the day, no Sun appearing, I found it ſo *hot*, that the drops followed one another on my face, whence I judged the *Mine-chamber* not to be far off.

62. Which I rather gueſs to be of *ſilver* than of any other *metal*, becauſe of the *Alabaſtrine* or *ſpar-like* ſubſtance found mix'd with it; which, ſays Mr. *Webſter*, was in ſome places intermixt alſo in the beſt *Silver-mine* ever yet found in *England*, the Ore whereof held about ſixty ſix pounds *per* Tun [w]. From all which it may be concluded, that 'tis probable at leaſt that here may have been formerly ſuch a *mine*, ſtopt up as I firſt thought by the *Aboriginal Britans*, upon the arrival and conqueſts of the *Romans* or *Saxons*, who not being able to recover their *Country* within the memory of man, it might be loſt like the *Gold-mine* of *Glaſs-Hitten* in *Hungary*, when *Bethlem Gabor* over-ran that *Country* [x]; or the Gold-mine of *Cunobeline* in *Eſſex*, diſcover'd again *temp. Hen.* 4. as appears by the Kings Letters of *Mandamus*, bearing date 11 May, An. 2. Rot. 34. directed to *Walter Fitz-Walter* concerning it [y]; and ſince that loſt again.

63. Till at length they found the *Urns*, and then 'twas plain and evident that it muſt have been formerly ſome *Roman* Work, and probably ſtill remains ſome old *Roman* Mine, in all likelyhood ſtopt up, when *Gallio* of *Ravenna* ſent hither with a *Legion* (the laſt that ever was in *Britan*) to repel the *Picts* and *Scots*, was fi-

[q] *Muſæum Metallicum, lib.* 3. *cap.* 8. [r] *Encel. de re Metallica. cap.* 22. [s] Account of his Travels, *p.* 93, 94. [t] *Mart: Rulandi Lexicon Alchemiæ.* [u] *Nat. Hiſt. lib.* 32. *cap.* 12. [w] Hiſtory of Metals, *cap.* 13. [x] Dr. *Brown's* Travels into *Hungary*. [y] Sir *John Pettus* his *Fodinæ Regal. cap* 9. & 13.

nally

nally recalled by *Valentinian* the third, to aſſiſt *Ætius* in *Gallia* againſt the In-roads of the *Francks* under *Clodion*, and to ſupport his then tottering, and quickly after ruin'd *Weſtern Empire:* At what time, ſays Mr. *Speed* [z] (but he quotes not his Author) they buryed alſo their *Treaſures*, whereof we have found parcels in all Ages ever ſince.

64. And this 'tis likely they might do, firſt by throwing in *Trees*, which not lying cloſe enough immediatly to ſupport the *Earth*, were after cover'd with *Haſels* (when the *Nuts* were fully ripe, which has occaſioned their endurance to this very day) on which they heaped *Earth*; which after ſome time ſinking below the ſurface of the other ground might occaſion this *Pond*, never thought to have been any other till the time above-mention'd.

65. After the *accidents* of *Oaks*, come we next to thoſe of *Elms*, whereof there ſtands one on *Binſey*-Common, at the *ſpurs* next the ground at leaſt 6 yards *diameter*, occaſion'd here, as (I ſuppoſe) at many other places, by erecting a Turf ſeat round the bottom of the *Tree*, it being elſewhere but of ordinary dimenſions. But this is not ſo extravagant in the exceſs of the growth of its *trunk* near the ground, but there is another more ſtrange for a defect in that place, *viz.* a great old *Elm* growing near the North-eaſt corner of the Bowling-green in *Magdalene College* Grove, diſbarked quite round, at moſt places two foot, at ſome at leaſt a yard, or four foot from the ground; which yet for theſe many years paſt has flouriſh'd as well as any Tree in the Grove.

66. Now how this ſhould come to paſs (all *Trees* being believed to receive their nouriſhment between the *wood* and *bark*, and preſently to die upon their ſeparation) many have admired, but few attempted to explain, being further diſcouraged by the abſence of the *pith*, the *Tree* being within as hollow as a *Drum*, and its outmoſt ſurface, where unbark'd, dead and dry beſide. All which I think had not ſtartled me much, but that I found it in our *Tranſactions* [a] poſitively aſſerted, that if any circle be drawn round any common *Engliſh tree* (only *Aſh* excepted) as *Oak*, *Elm*, *Poplar*, *&c.* by inciſion to the *timber* (how thin ſoever the knife be) ſo that no part of the *rind* or *bark* to the very ſolid *timber* be uncut, the *Tree* will die from that part upwards.

[z] Hiſtory of *Britan. lib.* 6. *cap.* 54. [a] Philoſoph. Tranſact. *Numb.* 43.

67. For

67. For the better clearing of which *point*, and avoidance of the attending *difficulties*, it will be but requisite, though two principal parts of our *tree* be wanting, to represent in *Sculpture*, at least a *sextant* of the body of an *Elm* cut transversly, together with the *bark* and *pith*, as well as the *wood*, as they all appear in a *Microscope:* Which without further trouble, or suspicion of falshood, I have carefully taken out of the *Anatomy* of *Trunks* lately publish'd by the accurate and ingenious Dr. *Grew*, as in *Tab.* 10. *Fig.* 2. only with some alteration of the *Letters* of *direction.* Wherein

AB, CD. *represent the whole bark of the tree.*
AB. *the skin of the bark.*
CD *one kind of sap vessels.*
EF. *another kind of sap vessels.*
GH. *the parenchyma of the bark wherein the Vesiculæ are so exceeding small, as difficultly to be perceived by the Microscope.*
IK, LM, NO, PQ. *the great air vessels postured chiefly in rings on the inner verge of every annual growth of wood.*
rs, rs, rs. *the small air vessels postured in cross bars.*
TVW *the pith.*
XY. *the diametral portions, or insertions runing through the several annual rings from the pith to the bark.*
zzzz. *the true wood, having been originally the sap vessels of the bark.*

now the *sap vessels* in this *diagram* being only to be found in the Bark, and those *passages* intercepted at so great distances, as abovemention'd in our *Elm*, the great *question* still returns as difficult as before, and as far from solution.

68. In the clearing whereof, it must first for certain be answer'd, that its a great mistake (though it have obtained so long) that a *tree* only lives by the ascent of its nourishment in or between the Bark and the Wood, and that *trees* must needs die when once they are bark'd round, here being matter of fact to confute those *opinions.* And secondly, That it is as certain a *truth* as the other is a *mistake*, that an *Elm* as well as an *Ash*, or any

any other *tree*, whatever Experiments may have been made, may and do's ſometimes live after 'tis diſbarked, and that therefore there muſt be other *veſſels*, beſide the *ſap veſſels* of the Bark, capable of the office of conveying *ſap*, ſufficient not only for the life, but flouriſhing condition of a *tree*.

69. And ſuch perhaps are a ſort of ſmall *veſſels* in the very *ſchematiſm* of the *wood* at zzzz, not perceptible by a *Microſcope*, it being on all hands agreed on, that the whole *wood* of *trees*, was all heretofore the *ſap veſſels* of the Bark: The Bark every year, as Dr. *Grew*[b] well obſerves, dividing into two *parts*, and diſtributing it ſelf two contrary ways; the *outer* part falling off toward the ſkin at A B, and becoming at length the ſkin it ſelf; and the *inner* part adding it ſelf to the *wood*, the *parenchymous* part thereof making a new addition to the *Inſertions* at X Y, and the *ſap veſſels* a new addition to the *lignous parts* at zzzz ſtanding between the *Inſertions*: So that a Ring of *ſap veſſels* in the Bark this year, becomes a Ring of *wood* in the *tree* the next; all which may be perfectly ſeen in the great *Oak* afore-mentioned, (§. 45. of this *Chapter*, and belonging to the ſame *College*) at ſeveral places where the rind is bruiſed off.

70. And if ſo, not unlikely they may ſo far retain their ancient office of conveying *ſap*, as to keep a *tree* alive, though not augment it, which perhaps may be one different uſe of theſe *ſap veſſels* in the *wood* from thoſe in the *bark*, theſe being ſufficient for the *continuation* of a *tree*, and the others ſerving only for its *augmentation*: Which if true, and our *tree* paſt its increaſe, as no doubt it has been many years ſince; what need has there been of any ſuch thing as the *ſap veſſels* of the *bark*? or indeed of the *bark* it ſelf?

71. Now that this indeed is certainly ſo, ſeems agreed on and confirmed by the learned and ingenious Mr. *Willughby* and Mr. *Ray*[c]; who have made it appear by irreſiſtible *experience*, that the *ſap* not only aſcends between the *bark* and the *tree*, but alſo through the very ſubſtance of the *wood*: And by the accurate Dr. *Grew*[d], who allows to the *wood*, as well *ſap veſſels* as *air veſſels*, it being proper to the *bark* to have *ſap veſſels* only. All which put together, ſeem abundantly to diſpel all appearing *dif-*

[b] Compar. Anatom. of Trunks, *c.* 3. [c] Philoſoph. Tranſact. *Numb.* 43. [d] Comparat. Anatom. of Trunks, *cap.* 8.

ficulties

ficulties, and no queſtion will ſatisfie all unprejudiced *Readers* how our *tree* comes to flouriſh, though diſbark'd all round.

72. But if there ſhall be any found ſo froward, as not to allow (againſt all experience) thoſe minute *ſap veſſels* in the ſubſtance of the *wood*, yet the viſible *prick'd circles* between the *annual coats* of the *wood*, obſerved alſo by Mr. *Willughby*, Mr. *Ray*, and Dr. *Tong* [e], which I ſuppoſe may be the large *air veſſels* of Dr. *Grew*, may be ſufficient for this purpoſe; eſpecially in *Elm*, where they are numerous and of two ſorts, as in *Tab.* 10. *Fig.* 2. I K, *&c.* r s, *&c.* It being the office of *air veſſels*, for about a month in *March* and *April* [f], before the new *ſap veſſels* of the *bark* are fit for uſe, to convey the *ſap* neceſſary for the *vegetation* of all *Plants*. And if ſo, in old *trees* that have done growing, and have no need of the *annual* new production of a *bark*, why may it not continually aſcend by them ſtill?

73. To which if it be objected, that a *tree* lives as well by *vegetable air* as *ſap*, and that if the *air veſſels* be continually fill'd with *ſap*, the *tree* muſt dye on the other ſide for want of *air*: It may eaſily be replyed, that the uſe of the *Inſertions* or *Diametral portions*, *Fig.* 2. X Y, interceding the *pith* at T V W, and the *parenchyma* of the *bark* at G H, all made of ſmall kind of *bladders* cluſter'd together, is for conveyance of *air*, as well as the *air veſſels* themſelves. But if it be further urged, that the *Diametral portions* only ſerve to convey it by the *bredth*, and not the *length* of the *tree*, which makes them inſufficient for this purpoſe; we have latitude enough, and can allow the *leſſer ſap veſſels* that lye in croſs bars at *r s* to ſupply that defect, and ſtill retain all the ranges of the great *air veſſels* at IK, LM, NO, PQ, for conveyance of the *ſap*, in ſuch like Trees as our old *Elm*.

74. And if it be further enquired, how it comes to paſs that ſome *trees* do dye upon the loſs of their *bark*, and all are not preſerved by the help of the *ſap*, or *air veſſels* of the *wood*: It may be anſwer'd, and probably rightly enough, that ſuch *trees* as are young, a growing, have a plentiful iſſue of thin *ſap* between the *bark* and the *wood*, and that readily *bleed* when they are wounded or bored, do moſt commonly (if not always) certainly dye: whereas ſome of the ſame *trees* when older, paſt growing, eſpecially if they have a more gummy juice, ſuch as *Aſh*, *Elm*, *Lime-*

[e] Philoſoph. Tranſact. *Numb.* 43. & 48. [f] Dr. *Grew* of the vegetation of Plants, *cap.* 1.

tree,

tree, &c. may live and flouriſh many years after their diſbarking, by the *ſaps* aſcent through the *ſap* or *air veſſels* of the *wood.*

75. Moreover, amongſt the *accidents* that have happen'd to *Elms*, I muſt not forget a very pleaſant one that fell out at *Middle-Aſton*, where cleaving of *Elm* blocks at one Mr. *Langſton*'s, there came out a piece ſo exactly repreſenting a ſhoulder of *Veal*, that it was thought worth while to preſerve it from the fire by the *owner* of it, by whom it was kindly beſtowed on me, as an addition to the reſt of my *Curioſities* of *Nature.*

76. But the moſt remarkable *accidents* that ever befel *trees*, perhaps here, or in any other *County*, were the *foundations* of two eminent *Religious houſes* both occaſion'd by *trees.* The firſt, *Oſeney Abby* founded in that place by *Robert D'Oyly* the ſecond, by reaſon of a certain *tree* that ſtood in the *meddows* where after he built the *Abbey*, to which it ſeems repaired a company of *Pyes*, as often as *Editha* the wife of *Robert* came to walk that way, which in company with her *maid* ſhe often uſed to do (as *Leland* expreſſes it) to ſolace *her ſelf*[g]: at whoſe arrival the *Pyes* were alwaies ſo *clamorous*, that *ſhe* took notice of it, and conſults with one *Radulphus Canon* of St. *Frideſwid*'s, what this might ſignifie: who cunningly adviſes, that ſhe muſt build ſome *Church* or *Monaſtery* where the *tree* ſtood, which *ſhe* inſtantly procures her *Husband* to do, and this *Radulphus* (her *Confeſſor*) to be made the firſt *Prior.*

77. What *tree* this was, *Leland* acquaints us not; but that which occaſioned the ſecond *Foundation* in the place where it is, was a *triple Elm*, having three trunks iſſuing from one root. Near ſuch a Tree as this Sir *Thomas White*, Lord Major of *London* (as we have it by Tradition) was warned in a *Dream* he ſhould build a *College*, for the education of Youth in Religion and Learning: whereupon he repairs to *Oxford*, and firſt met with ſomthing near *Gloceſter-Hall* that ſeem'd to anſwer his *Dream*, where accordingly he erected a great deal of Building. But afterward, finding another *Elm* near St. *Bernards College*, ſuppreſt not long before by King *Hen.* 8. more exactly to anſwer all the circumſtances of his *Dream*, he left off at *Gloceſter-Hall*, and built St. *John Bapt. College*, which, with the very *Tree* beſide it, that occaſion'd its *Foundation*, flouriſhes to this day, under the *Preſidence* of the Reverend and Learned Dr. *Levinz*, a cordial promoter of this *Deſign.*

[g] *Lelandi Itinerarium, Vol.* 2. *pag.* 18, 19.

78. Beſide the *Elms* at St. *Johns* knit together at the *root*, there are two *Beeches* in the way from *Oxford* to *Reading*, near a place called *Cain-end*, more ſtrangely joined together a great height from the ground: for the bodies of theſe *Trees* come from different roots, and aſcend parallel to the top, but are joined together a little before they come to bough, by a tranſverſe piece of timber entering at each end into the bodies of the *Trees*, and growing jointly with them, for which reaſon 'tis commonly called the *Gallow-tree*, though the piece that intercedes them lies ſomwhat obliquely: How this ſhould come to paſs many have wondered, but the problem I gueſs may be eaſily ſolved, only by allowing the tranſverſe piece of Timber to be one of the boughs of the *Tree* to which its lowermoſt end ſtill joins, which whilſt young and tender, might bear ſo hard againſt the body of the neighboring *Tree*, that with the continual motion of the wind, it might not only fret it ſelf aſunder, but gall off the *bark* too of the other *Tree*; which cloſing up again in calm weather at the riſing of the *ſap*, might well include ſo near a neighbor, firſt within its *bark*, and after ſome time within the *wood* it ſelf: which I have obſerved to have been done but very lately in *New College* Gardens, where the boughs of two different *Sycomores* are thus grown together, only by bearing hard on one another, and interchangably fretting away each others *bark*, and then cloſing up again at the riſing of the *ſap*.

79. There have alſo ſome *accidents* befallen the *Aſh* and *Willow*, not commonly met with; the former whereof in a Cloſe of one Mr. *Coker*, of the Town of *Biſſeter*, grows frequently out of the boal of the other, yet not as 'tis uſual amongſt other *Trees*, but ſo that the roots of the *Aſhes* have ſome of them grown down through the whole length of the trunks of the *Willows*, and at laſt faſtening into the earth it ſelf, have ſo extended themſelves that they have burſt the *Willows* in ſunder, whoſe ſides falling away from them and periſhing by degrees, what before were but the *roots*, are now become the *bodies* of the *Aſhes* themſelves. But this happens only to *Willows* that have been lopt at ſix or ſeven foot high; the *Willows* at *Enſton*, in the walks near the Rock, whereof there are ſeveral about 50 foot high, being incapable I ſuppoſe of any ſuch *accident*.

80. Beſide this unuſual growth of the *Aſh*, I have met with other

other *accidents* that frequently attend it, which becauſe ſo much commended by *Pliny*[h] in *Maple*, in which they are common, I think ought much more to be noted in this: And ſuch are the *Nodoſities* called *Bruſcum* and *Molluſcum*, to be found in *Aſh* as well as *Maple*, which when cut, ſhew a curled and twining grain; the *Bruſcum* thick and intricate, the *Molluſcum* being ſtreaked in a more direct courſe. With the *Molluſcum* of *Aſh* there is a whole Cloſet wainſcoted, at the much Honored Mr. *Stonor*'s of *Watlington* Park, the grain of the panes being curiouſly waved like the *Gamahe*'s of *Achats*. And at the Worſhipful Mr. *Reads*, of the Pariſh of *Ipſden*, the *Bruſcum* of an old *Aſh* is ſo wonderfully figured, that in a Dining-table made of it (without the help of fanſie) you have exactly repreſented the figure of the Fiſh, we commonly call a *Jack*, though endeavoring to *mend*, they have ſomwhat *marr'd* it by *Art*: and in ſome other *Tablets* the figures of a *Unicorn*, and an old *Man* from the navel upwards, but neither of theſe ſo plain as the former.

81. *Jacobus Gaffarellus*, amongſt his unheard of *Curioſities*[i], tells us of a *Tree* found in *Holland*, which being cut to pieces by a wood-cleaver, had in one part of it the figure of a *Chalice*, in another that of a Prieſts *Albe*, in another that of a *Stole*; and in a word, there were repreſented very near all the *ornaments* belonging to a *Prieſt*: which relation if true, ſays he, it muſt needs be confeſt, that theſe figures could not be there caſually or by chance; and indeed 'tis very hard to think, how ſo many things pertinent to the ſame *office*, ſhould thus meet together without ſome deſign of *Nature*. However, till I am better ſatisfied of the truth of the thing, or convinced by the ſight of ſome other ſuch *Curioſity*, I cannot afford to think ours (being altogether independent) more than meer *accidents*.

82. Beſide theſe unuſual *accidents* of whole *Trees*, or their *Trunks*, there are ſome alſo that have happened to their upper branches and leaves, whereof the former are ſomtimes *faſciated*, and the latter *ſtriped*. In *willows*, and ſome other of the ſofter woods, the uppermoſt boughs are commonly *faſciated*, but the beſt of the kind I ever yet ſaw, was the top-branch of an *Aſh*, which I met with at *Biſſeter*, not only *faſciated*, but moſt uniformly wreathed two or three times round. And there is a good example of this

[h] *Nat. Hiſt. lib.* 16. *cap.* 16. [i] Unheard of Curioſities, *chap.* 5.

nature, in a top branch of *Holly* hanging up in the Gate-houſe of the *Phyſick-garden*, whence 'tis plain, that this happens alſo to the hardeſt woods; and in both, by the aſcent of too much nouriſhment, though in branches of *Trees*, eſpecially ſuch as are not only *flat* but *helically* curled, I gueſs there concurs ſome blaſt, or ſome ſuch like matter, that contracts the *fibers* and ſo turns them round, beſide the exceſs in the aſcent of their nouriſhment.

83. As for the ſtriped leaves of *Trees*, as well as thoſe of *Shrubs*, and *herbaceous Plants*, I ſuppoſe they may be met with almoſt in every *kind*. The greater *Maple*, miſcalled the *Sycomore*, was found ſtriped white not many years ſince in *Magdalen College* Grove, and tranſlated thence into the *Phyſick-garden*, where it flouriſhes ſtill and retains its *ſtripings*; and I hear of a *ſtriped Elm* ſomwhere in *Dorſet-ſhire*. Dr. *Childrey* [k], and out of him the ingenious Mr. *Evelyn* [l], inform us of an Oak in *Lanhadron* Park in the County of *Cornwall* (to omit the painted *Oak* in the Hundred of *Eaſt*) which conſtantly bears leaves ſpeckled with white. And there was another of theſe found this inſtant year, 1676. by my worthy Friend Dr. *Thomas Tayler*, in a place called *Frid-wood*, in the Pariſh of *Borden* near *Sittingbourn* in *Kent*. But of theſe more hereafter, when I come into thoſe *Counties*.

84. Of *Unuſual trees* now cultivated in *Oxford-ſhire*, there are ſome remarkable; ſuch is the *Abele-tree*, advantagiouſly propagated by Sir *George Croke* of *Waterſtock*, which he does, by cutting *ſtakes* out of the more ſubſtantial part of the *wood*, which put into moiſt ground grow more freely than *willows*, coming in three or four years time to an incredible height. And ſuch are the *Fir-tree*, and the leſſer *mountain Pine*, whereof there are ſeveral *Nurſeries* planted in the *Quincunx* order, at *Cornbury*, in the *Park* of the Right Honorable the Earl of *Clarendon*, which they propagate by *ſlips* twiſted, as well as by *Kernels*, to that advantage that there is great hopes of beautiful and ſtately *Groves* of them; ſuch as I met with at the Right Worſhipful Sir *Peter Wentworths* at *Lillingston Lovel*, where there are three Walks of *Firs*, moſt of them 20 yards high.

85. Which Pariſh, if the Reader look for in the Map of *Oxfordſhire* he muſt not expect to find, though it belong to the *County*,

[k] *Britannia Baconica in Cornwall.* [l] Diſcourſe of Foreſt Trees. *cap.* 3.

it

it lying five miles within *Buckingham-ſhire*: as on the other ſide ſeveral Pariſhes of *Berkſhire*, *Buckingham-ſhire*, and *Worceſter-ſhire*, are placed within *Oxford-ſhire*. How theſe things come to paſs we have little of certainty, but in all probability this *Lillingſton* was accounted in *Oxfordſhire* for the ſake of the Lords *Lovels*, whoſe Inheritance, from the addition, we may conclude it once was; who being powerful *men* in theſe parts, and not unlikely moſt times the *Kings Lieutenants*, might have permiſſion to reckon this their own *Eſtate*, within their own Juriſdiction as part of *Oxford ſhire*; as I ſuppoſe all other *Pariſhes* thus placed out of the body of their *Counties*, may alſo have been.

86. From this neceſſary, and therefore I hope pardonable digreſſion, I proceed to ſome *Fruit-trees* not ordinary elſewhere, ſuch as the *double-bearing* Pear-trees: whereof I met with *one* in the Pariſh of *Haſeley*, at a place called *Latchford*, in the Hort-yard of Mr. *Gooding*, called the Pear of *Paradice*, whoſe firſt Crop is ripe about *Midſummer*, and the ſecond at *Michaelmaſs*. There is alſo another of theſe, but of a different kind, in the Pariſh of *Stanlake* at the *Chequer-Inn*, called the *Hundred-pound* Pear, which Bloſſoms at two diſtinct times, and bears two Crops, whereof it has both ſorts (much like the Fig) upon the Tree at a time, ſome ripe, and others green. But in both theſe *trees*, the Pears in the ſecond Crops are ſomwhat leſs than of the firſt, and grow both after a peculiar manner, moſt of them, if not all, coming forth at the ends of the twigs, which are all the pedicles they ſeem to have; and therefore on the *tree* they do not hang downwards, like thoſe of the firſt Crop, but point up in the *air*, or any other way the ſhoots direct them.

87. At *Corpus Chriſti College* they have a ſort of *Pear-tree*, that bears Fruit in hardneſs little inferior to the younger ſhoots of the very *tree* that bears them; and therefore not undeſervedly by ſome called the *Wooden-pear*, though in wet years I have known them pretty ſoft: but generally they are ſo ſound, and of ſo unalterable a conſtitution, that I have now ſome by me that were ſeaſonably gather'd, above ten years old, as hard and firm as ever they were at firſt, only ſomwhat leſs than when firſt gather'd; for which very reaſon, in ſome parts of *Worceſter-ſhire* where they have plenty of them, they are called *Long-laſters*, being not ſubject to rot like other *Pears*.

88. And

88. And thus I had finish'd the Chapter of *Plants*, but that I think fit to acquaint the *Reader* of a further design I have concerning them, *viz.* Of enquiring hereafter into some other *accidents* of *Plants* of an inferior quality to any before mentioned; which yet perhaps are more abstruse in their consideration than the more noted ones are. And such are the *blebs* or *blisters* we find on the leaves of many *Trees* and *Shrubs*, which sometimes happen to them after heat and droughts, and sometimes too upon cold nipping weather: but whether thus infected from the *air* from without, or by *juices* within, or by *both*; and when by one, or the other, or both together? is a *Question* requires a great deal of time, and more sedulity than has yet been afforded, to be but probably solved.

89. And this I the rather design, because all that I find certain concerning them yet, is only that the weak, and free growing sappy *Trees* are most subject to them, and the stout *Ever-greens* but little, if at all: that the *infection* for the most part is under, and the *blister* above the leaf, but sometimes otherwise: that the *blisters* sometimes have *Insects* in them, sometimes bear *fungus*'s on their tops[1], and sometimes have neither: But what kind of *Insects* or *fungus*'s they are, that belong to each *Plant* that have them? or whether the same *Plants* have not sometimes different *Insects* and *fungus*'s, especially in dry, and wet years? are also *Questions* that require indefatigable industry, to be in any measure satisfied.

90. And yet even in these, if *God* give me life, and I find encouragement to proceed in my *undertaking*, I intend to attempt something. As also to find out how it comes to pass, that of the *seeds* of many *Plants*, such as *Oak*, *Ash*, *Elm*, *Beech*, *Yew*, *Juniper*, *Hemp*, *&c.* there come some *Plants* again that will never bear *seeds*, if not timely prevented by our Learned *Professor* of *Natural Philosophy*, the Ingenious Dr. *Millington*; the Learned Dr. *Morison* our *Botanic Professor*; or the Learned and accurate Dr. *Grew*, now reading, writing, and practising the *Anatomy*, of *Vegetables*.

[1] See Mr. *Hooks* Micrograph. Observat. 19.

CHAP.

CHAP. VII.

Of Brutes.

HAVING done with the *Vegetative*, I proceed to the *Animal Kingdom*, wherein I ſhall conſider firſt, that part of *it* that indeed has *apprehenſion* of external *Objects*, of *Pleaſures* and *Pains*, and *Locomotion* to make addreſs to the *one*, and fly the *other*, but is void of *reaſon*; within which may be comprehended all manner of *Brutes*, ſuch as *Birds*, *Inſects*, *Fiſhes*, *Reptils*, and *four-footed Beaſts*, which I preſume may be a *ſubject* ſufficient for this *Chapter*, though as in the former of *Plants*, I intend only to mention *ſuch*, as either have not been *noted before*, are very *unuſual*, or have ſomthing *extraordinary* attending them; Leaving what concerns *Men* for a *Chapter* by it ſelf.

2. And herein, as before in the *Chapter* of *Formed ſtones* (and as I intend for the future in all other *Chapters* ſo far forth as they will bear it) I ſhall obſerve the *method* of the whole *Eſſay*, and firſt treat of ſuch *Animals* as are Inhabitants of the *Heavens*, then of thoſe that belong to the *Waters*, and laſtly of ſuch as inhabit the *dry Land*; of which in their order.

3. But amongſt the inhabitants of the *Air* or lowermoſt *Heaven*, it cannot be expected in ſo ſmall a County, I ſhould produce *many* not already noted, ſince the *feathered* Kingdom has been ſo lately and ſo carefully ſurveyed, by the Learned and Induſtrious *Francis Willughby* Eſq; Nor indeed could I meet with any omitted by him, except perchance a *little Bird*, ſomtimes ſeen, but oftner heard in the *Park* at *Woodſtock*, from the noiſe that it makes, commonly called the *Wood-cracker*: Deſcribed to me (for I had not the happineſs to ſee it) to be about the bigneſs of a *Sparrow*, with a *blue* back, and a *reddiſh* breaſt, a *wide* mouth and a *long* bill, which it puts into a crack or ſplinter of a rotten bough of a Tree, and makes a noiſe as if it were rending aſunder, with that violence, that the noiſe may be heard at leaſt *twelve ſcore* yards, ſome have ventured to ſay a *mile* from the place.

4. Which is all I could find in the *County* of *Oxford* omitted by that careful and ingenious *Author*, except I may have leave to number

number the *Diabolus marinus*, or Sea *Devils-bird* mention'd by *Johnston* [m], and others, and to be ſeen in the Repoſitory of the *Bodleyan Library*: Which though it has ſo ill a name, contracted I ſuppoſe from its *exquiſite* blackneſs, and the ill it bodes to *Seamen* whenever they ſee *it*; yet is a very beautiful *Bird*, and has therefore by ſome been numbered amongſt the *Manucodiata*'s, and called the *black Bird* of *Paradiſe*. But of this no more, becauſe no inhabitant of the *Land*, much leſs of this *County*.

5. Which yet I think I had not forborn to deſcribe, had our *Bird* been perfect, it not being to be found in *Sculpture* in any *Author* that I know of: For though I did it not in Foreign undeſcribed Plants growing in our *Gardens*, well knowing the much abler Dr. *Moriſon* to be about it: Yet I think I may take the liberty to do it in *Animals*, not hearing of any body elſe now deſigning ſuch a work.

6. And therefore ſhall not omit the *Hen* from the *Iſle* of St. *Helen*, now living, and in the poſſeſſion of the Right Honorable the Lord *Norreys*, a great lover of *Curioſities* in all ſorts of *Animals*: which for her kind I think may be accounted one of the γαμφώνυχες, and amongſt them of the rapacious, carnivorous ſort, having her *beak* near its end, crook'd after the manner of a *Vultur*, and ſtriking with her *pounces* like a *Hawk*, though her *talons* indeed are not much more turned than thoſe of a common *houſe Hen*.

7. In her *head* 'tis true ſhe is ſomwhat like the ſecond ſort of *Gypaëtos* of *Aldrovandus* [n], or the *Percnopteros* of *Johnſton* [o], being bald and wrinkled, but not quite to the hinder part of the *head*, as they are ſaid to be; having from the crown of her *head* down to the beginning of her *neck*, and ſo behind her *ears* to her *throat*, a ſort of ſlender *plume*, like *briſtles*, which ſhe erects or lets fall at pleaſure: in her *gorge* alſo and *pounces* ſhe is very unlike them, for though ſhe be *carnivorous*, yet her *gorge* is ſlender, and though ſhe ſtrike with her *pounces*, they ſcarce exceed in bigneſs thoſe of a common *houſe Hen*, whereas the *gorge* and *pounces* of the *Gypaëtos*, and *Percnopteros*, are protuberant and very long; nor has ſhe like them any part of her *plume* ſo diſpoſed at the top of her *back*, as to repreſent a *Monks* hood, thrown backward from his head [p].

[m] *De Avibus, lib. 4. tit. 2. cap. 4.* [n] *Ornitholog. Tom. 1. lib. 2. cap. 10.* [o] *Hiſt. Nat. de Avibus, l.b. 1. Tit. 1. cap. 2. Art. 4.* [p] *Vid. Willughbeii Ornitholog. lib. 2. cap. 3 Artic. 8. & Tab. 4.*

8. How-

8. However, for her near reſemblance of them in her *head*, and ſome other *parts*, we cannot but allow her to be a Bird of that *genus*, though undeſcribed; and accordingly adviſe, ſhe may be placed amongſt them by future *Ornithologiſts*, to which purpoſe let them take the following deſcription.

9. Her *beak* is ſtraight, only at its extremity, where it is turned like the *Vulturs*, in length 2 inches $\frac{3}{4}$, and her *Nares* long and narrow, as in *Tab.* 10. *Fig.* 3. The *pupillæ* of her *eyes* are full and black, encompaſſed with *Irides* of a dark brown colour, bald and wrinkled to the top of the head, and ſo round by the *ears* (which are of an irregular *oval* form) next which ſtand the *pennæ ſetiformes* as aforeſaid; her *gorge* not at all protuberant, but ſlender; her wings complicated or folded to her body, reach almoſt to the end of her *train*, and extended at full ſtretch, have their extremities diſtant about five foot, being ſomwhat larger than thoſe of a *Lanar*, and containing in each of them 34 *Remiges*, *i.e.* beſide the five *feathers*, 29 at leaſt or 30 *flags*: her *thighs* and *pounces* are much like thoſe of a common *houſe Hen*, having the outermoſt *talon* knit to the reſt by a *membran*. In the whole, ſhe is bigger than a *Moſcovy Goſhawk*, from the point of her *beak* to the extremity of her *train*, above two foot long, her *plume* for the moſt part being of an Aſh-colour, mixt with ſome white feathers, and growing whiter upon *mewing*, as thoſe of *Hawks* do.

10. Other *Birds* there are *here* that are but rarely ſeen, yet breed in this *Country*, and are continually with us, and therefore to be numbred amongſt thoſe we call *perennial*. Such are the *Upupa* the *Hoopoe*, or *Hooping-bird*; whereof I ſaw one alive on *Otmoor*, and another was given me for the *Repoſitory* of the *Bodleyan Library* (killed ſomwhere about *Caſſenton*) by one Mr. *Painter* Alderman of *Woodſtock*. A Bird it is to admiration beautiful, being curiouſly deck'd with feathers of divers colours, and with a large *creſt* on its head, as it is exquiſitely engraven both by Dr. *Charleton* * and Mr. *Willughby*; but like the *Diabolus marinus*, never appearing or being heard (as the *vulgar* will have it) till immediatly before ſome approaching calamity.

11. As for Birds that have caſually flown hither, or come but at ſome certain *ſeaſons* of the year, by *Naturaliſts* ſtiled *Aves mi-*

* *Onomaſt. Zoicon. Titul. Aves, Claſſe Conorarum.*

gratoriæ, beſide *Swallows*, and ſome well known winter Fowl: The *Cormorant* has been obſerved to come hither about *Harveſt* time, whereof there was one killed from St. *Maries* ſteeple (tired with a long flight) *An.* 1675. and another young one taken up in *Arncot-field* fallen down in the Corn, and brought me to *Oxford.*

12. But what is ſomwhat ſtranger, in the year 1644. the *Pica Braſilienſis*, or *Toucan*, whoſe *beak* is near as big as its whole body, was found within two miles of *Oxford*, and given to the *Repoſitory* in the *Medecine-School*, where it is ſtill to be ſeen; which argues it a *Bird* of a very *rank* wing, there being a neceſſity of its flying from *America* hither, except we ſhall rather ſay it might be brought into *England* by Ship, and afterwards getting away might fly *hither.*

13. Of *Birds* well known of *unuſual colours*, I have met with *two* remarkable examples: the one a white *Linnet*, given me by Mr. *Lane* of *Deddington*; and the other a ſort of *white*, and *pyed Pheſants*, kept by the Right Honorable *James* Lord *Norreys* of *Ricot:* Whereof how ſome happen to be of different colours from the reſt of their *ſpecies*, eſpecially when they have deviated from their kind by *whiteneſs*, hath been a *queſtion* thought worthy of ſevere examination. In the proſecution whereof, it hath been obſerved (as before in the *Chapter* of *Plants*, §. 38.) that *whiteneſs* often proceeds from a defect of moiſture or nouriſhment; and it hath been a received opinion concerning *Birds*, that they may become *white* by plucking off their firſt feathers, which will cauſe their new ones to come forth of *that* colour. But beſide theſe ways of *art* and *privation*, it is manifeſt that *Nature* her ſelf ſomtimes poſitively deſigns ſuch a colour, even in *ſpecies* too that ſeldom are of it, many other *Animals* as well as *Birds*, having been produced of *that* colour unuſual to the *ſpecies*, as brisk and well liking as any others whatever, ſuch as *white Moles*, *Rats*, *Mice*, and ſomtimes *white Fawns*, where there has been neither *Buck* nor *Doe* of that colour in the Park.

14. And this I gueſs ſhe does by giving ſome certain *Individuals* of each *ſpecies* a ſkin of finer and more contracted *pores* than others, which will cauſe *whiteneſs* in feathers, hair, *&c.* by not permitting of the *ſulphureous particles* to expire, which give *variety* of colours [q]; thus we ſee in the *cicatrization* of wounds where

[q] *Vid. Williſium de Ferment. cap.* 2.

the

the ſkin is drawn together like a *purſe*, and the *pores* cloſed up, the hair comes conſtantly *white*: thus the ſubtile *Veterinarians* procure *white ſtars*, or other deſired *marks* in the fore-heads of their *horſes*; and I have ſeen the ſkins of *black* Grey-hounds powdered with *white*, or made *Ermyneſs*, by applying *wood-ticks* to their ſkins when young, both which are performed alſo by *cicatrization*, and cloſing the *pores* of the ſkin, thereby hindering the exhalation of the *Sulphur* in thoſe parts.

15. Which will further appear from an obſervation of my Lord *Verulam*'s concerning *Flowers*, whereof the *whites* for the moſt part are more *inodorate* than other colours: And this he makes out in many *Flowers*, as ſingle *white* Violets, the *white* Roſe, *white* July-flowers, *&c.* We find alſo, ſays he, that bloſſoms of *Trees* that are *white* are commonly *inodorate*; as of *Cherry*, *Pear*, and *Plum-trees*: whereas thoſe of *Apple*, *Crab*, *Almond*, and *Peach-trees*, are bluſhy, and ſmell ſweet. The cauſe whereof is, that the texture of theſe *Plants* producing *white* Flowers (excepting ſuch as produce *white* Flowers only, as *Lillies*; or are extravagantly ſucculent, as the *white Satyrion*) is ſo very cloſe and fine, that it will not permit any *ſulphureous* particles, which are alſo the cauſe of *ſmells*[r] as well as *colours*, in any meaſure to *exhale*. Which poſſibly may be found true, if duly examined, in all ſorts of *Animals*; and if ſo, we hereby may be profitably inſtructed what *Beaſts* of each kind are leaſt offenſive, and fitteſt for the converſation of *men* or *women*, eſpecially *Ladies*, who commonly have great ſagacity in ſmelling, may hereby be directed in the choice of their *Melitæi* or *Lap-dogs*.

16. As for *pyed Birds* that are generally of another colour, ſuch as *pyed Pheſants*, *&c.* the caſe is eaſier, for ſuch are produced either by common colour'd *Hens* troden by a *white Cock-pheſant*, or *vice verſâ*; which poſſibly may have happened alſo by our *white Linnet* whether male or female, or in any other *Birds* of any other *ſpecies*, as we ſee it falls out in *Dogs* and *Horſes*, and moſt other *Animals*.

17. And this had been all concerning *Birds*, but that at *Witney*, *Anno* 1674. I met with an *Egg* about the bigneſs of a *Pidgeons*, containing another imperfect one in it, given me by Mr. *Hinton* the then Miniſter there, which ſeems to have been in the way toward ſuch an *Ovum in Ovo* as is mentioned by the Learn-

[r] *Idem in loco citato.*

ed Dr. *Harvey*, and ſhewn by him to that incomparable Prince, *Charles* the *Martyr*, and many others; *Vide inquit* Ovum *perexiguum* (Fabricius *Centeninum vocat*, & *Noſtrates* mulieres *Gallo aſcribunt*) *cruſtâ tectum*, *intra aliud Gallinæ* ovum *majus*, *perfectum & cortice circumcirca obtectum*, *contineri*[s]. Juſt ſuch an *Egg* as this, pregnant with another, is preſerved in the Repoſitory of the *King* of *Denmark*, which was ſhewn by his Majeſty to *Tho. Bartholine*, as he teſtifies in his *Epiſtles*[t]; who alſo ſaw another in the year 1669[u]. And *Geo. Sebaſtian Jungius* met with another of theſe the nineteenth of *June*, 1671[w]. which are Authorities enough (though more might be brought) to juſtifie my mentioning the thing, though by ſome thought inconſiderable.

18. Yet before we take leave of the inhabitants of the *Air*, we have ſomthing worth notice concerning winged *Inſects*, and particularly of the feminine *monarchy* of *Bees*, not only the *Prognoſticators*, but *Concomitants* of *Eloquence*: of their Prophetical preſages of *future Eloquence*, we have inſtances in *Plato*, *Pindar*, *Lucan*, and that eloquent Father of the Church St. *Chryſoſtom*, about whoſe mouths, whil'ſt *Infants*, the *Bees* gathered, and dropt their *hony*, thereby fore-telling thoſe *Rhetorical Endowments* they ſhould hereafter be poſſeſt of, which accordingly came to paſs.

19. But none of thoſe, ſays the induſtrious *Butler*[x], are more memorable than the *Bees* of *Ludovicus Vives*; who being ſent in the year 1520. by *Cardinal Wolſey* to *Oxford*, to be publick *Profeſſor* of *Rhetorick* there, and placed in the *College* of *Bees* (*Corpus Chriſti* being ſo called by the *Founder* in his *Statutes*) was welcomed thither by a ſwarm of *Bees*, which to ſignifie the incomparable ſweetneſs of his *Eloquence*, ſetled themſelves over his *head* under the leads of his *Study* (at the *weſt-end* of the *Cloyſter*) where they continued about 130 years.

20. *The truth of this ſtory appears as well by the general voice of the* Houſe, *who have received it by tradition*, *as by the ſpecial teſtimony of a worthy Antiquary* [Mr. Brian Twine] *who affirmed* [to Mr. Butler] *that he had often heard his maſter*, Dr. Benefield (*one of the publick* Profeſſors *of* Divinity) *who then had* L. Vives's *chamber and ſtudy*; *and* Dr. Cole (*then* Preſident, *and in* Q. Maries

[s] *De Generat. Animalium, Exercit.* 10. *de Ovi cortice.* [t] *Epiſt. Cent* 3 *Ep.* 42. & *Epiſt. Cent.* 4. *Ep.* 63. [u] *Miſcellanea Cur. Med. Phyſ. Acad. Nat. Curioſorum. An.* 1. *obſerv.* 36. [w] *Ibid. An.* 2. *obſerv.* 250. [x] Hiſtory of Bees, *Numb.* 59.

days

days Scholar *of this* Houſe) *to ſay as much, calling theſe* Bees, Vives *his* Bees.

21. *In the year* 1630. *the leads over* Vives *his ſtudy* being pluckt up, [it then being the ſtudy of Mr. *Gabriel Bridges*] *their* Stall *was taken, and with it an incredible maſs of hony: but the* Bees, *as preſaging their intended and imminent deſtruction (whereas they were never known to have ſwarmed before) did that* Spring *(to preſerve their famous kind) ſend down a fair ſwarm into the* Preſidents *garden, which in the year* 1633. *yielded two ſwarms; one whereof pitched in the garden for the* Preſident; *the other they ſent up as a new* Colony *to preſerve the memory of this* melliſluous Doctor, *as the* Univerſity *ſtiled him in a* Letter *to the* Cardinal. Thus far Mr. *Butler.*

22, And there *they* continued, as I am informed by ſeveral ancient Members of that *Society* that knew them, till by the *Parliament Viſitation*, in *Anno* 1648. for their Loyalty to the *King*, they were all, but *two*, turned out of their places, at what time with the reſt of the inhabitants of the *College*, they removed themſelves, but no further than the *Eaſt* end of the ſame *Cloyſter*, where as if the *feminine* ſympathized with the *maſculine* Monarchy, they inſtantly declined, and came ſhortly to nothing. After the expiration of which ancient *Race*, there came, 'tis true, another *Colony* to the *Eaſt* corner of the *Cloyſter*, where they continued till after the return of his moſt Sacred *Majeſty* that now is: but it not being certain that they were any of the remains of the ancient *Stock* (though 'tis ſaid they removed thence to the firſt place) nor any of them continuing long there, I have choſe rather to fix their *period* in the year 1648. than to give too much credit to uncertainties.

23. And thus unhappily, after above ſix ſcore years continnance, ended the famous ſtock of *Vives* his *Bees*, where 'tis pitty they had not remained, as *Virgil* calls them, an *Immortale Genus*[y]. However, ſince they are now irrecoverably loſt, it would not I think be amiſs, if the *College* provided them another *Colony*; not that I think that Learned *Society* wants any ſuch monitor of *Induſtry*, but that it ſeems but congruous, they ſhould always have by them the *Thing*, whereof their whole Houſe is but the *metaphor*, the Founder calling it *Alvearium*, and the Students,

[y] *Georgic. Lib.* 4.

Inge-

Ingenioſas apes, dies noctesque Ceram ad Dei honorem, & dulciflua mella conficientes, ad ſuam & univerſorum Chriſtianorum commoditatem. And this I the rather perſwade, becauſe by the new diſcovery of that excellent method of *Bee-houſes* and *Colonies*, they are freed from moſt, if not all the hazards, charge, and trouble that heretofore attended *them*: Not to mention the advantage and profit accrewing by them, which has always been judged ſo conſiderable, that there have been ſeveral *Tracts* written and publiſh'd full of experiments, directions, and methods to be uſed in the menage of theſe *Inſects*.

24. But none yet extant that I know of comparable to what are practiſed by *John Lad* of *Over-Worton*, and *William Tayler* of *Warkworth*, who though a *Northampton-ſhire* Man, has *Apifactories* in this *County*, who profeſs (as I am informed by the Reverend Mr. *Clark* Rector of *Dreyton* near *Banbury*) 1. That they can take *ſwarms* out of any *ſtock* that is able, and neglects to *ſwarm*, without any prejudice to the *ſtock*. 2. That they can take *hony* out of a *ſtock* without that hazard to the *Bees*, which (they ſay) the way propoſed by the *Author* of the *Colonies* is ſubject too. 3. That they can ſecure any *ſtock* from the invaſion of *Robbers*. 4. That they can ſo order an old *ſtock*, that the *Bees* ſhall gather pure *Virgin* hony. 5. If a *ſtock* be in low condition, they can preſerve and recruit it, ſo as it ſhall do well. 6. They can take away a *Queen* where there is more than one in a *hive*, and place *her* in a *ſtock* where the *Queen* is dead, or otherwiſe wanting, and by that means keep the *ſubjects* together, which would elſe diſperſe. 7. If a *Queen* wants *ſubjects*, they can draw out of ſeveral ſtocks ſupplies in what number they pleaſe, that ſhall ſettle under *her* government. And theſe *operations* they commonly practice, which becauſe profitable to *them*, they are unwilling ſhould be made too common, which yet they are ſo ingenious as not to deny to communicate to fit *perſons* upon reaſonable *terms*.

25. Of other flying *Inſects*, I have minded only the *Muſcæ aquaticæ*, ſuch as are generated in the waters, and come of *Cadworms*, and therefore called by *Johnſton*, *Phryganides*[z], *quod è Phryganio Monſeti*[a] (the *Caddis* of the *Engliſh*) *ortum habeant*:

[z] *Hiſt. Nat. de Inſectis, lib.* 1. *tit.* 2. *cap.* 2. *art.* 2. *punct.* 4. [a] *Inſect. ſive Min. An. Theat. cap.* 12. *de Muſcarum uſu.*

Nor

Nor ſhall I venture to deſcribe above *one* of theſe neither (and that only as a *ſpecimen* of what I intend of the *reſt*, as faſt as I can compaſs the *method* of their productions) *which* I think I may call *Muſca è Phryganio ſaxatili*, there being a *ſtone*, as well as a *ſtick Caddis*, or *Cad-worm*; in the generation of which, *Nature* ſeems to obſerve the following *method*. Firſt, there appears on the *ſtone* to which many of them ſtick, as in *Tab.* 10. *Fig.* 4. only little *bubbles* of a glutinous nature, like the *ſpawn* of *frogs*, which by the deſcent of *gravel* and *ſand* that *ſtick* to *them*, are formed into *ſtone Caddis* houſes, including the *Animal* therefore called the *ſtone Caddis*; which after it has continued in its *rough-caſt ſtone* houſe its due time, gets off the *ſtone* either to the bank of the *River*, or climes up ſome *reed*, where alſo leaving its *houſe*, it becomes a *flye*, ſomwhat like in ſhape to the *Muſcæ* διπτέρυγες, or *bipiles Moſeti*[b], that come of the *ſtick Caddis*, only it is ſhorter, and wants both the *Antennæ* and *forked briſtly* tail; but moſt of all like the *Breiſe*, only the *Brieſe* is all *gray*, and this has a *black* head and *dark brown* wings. See its form, *Tab.* 10. *Fig.* 5.

26. Other *water Flys* there are that come of ſuch *worms*, called *Cock-ſtars*, *Rough-coats*, *Pipers*, *&c.* of which no more at preſent till further obſervation; but that though at laſt they come to be *flying Inſects*, yet at firſt they are all of them *water Animals*, which puts me in mind of proceeding next,

27. To the *Fiſhes*, whereof we have a ſort in the River *Iſis*, that we call here a *Pride*, of the long cartilagineous ſmooth kind, concerning which *Authors* ſeem ſo obſcure, that I know not whether it be deſcribed at all; or if it be, it is done ſo imperfectly, that perhaps it may be acceptable if I contrive another. The *Fiſh* the moſt like it of any I can find, is the *Lampetra parva fluviatilis* of *Rondeletius*[c], rendred by Dr. *Charlton*[d] and Dr. *Merret*[e], the *Stone-grig*: it having a mouth cut neither perpendicularly downward, nor tranſverſly, but hollowed as it were between two cheeks, without an under jaw, after the manner of *Leeches*; on the top of its head it has *one*, and on each ſide *ſeven* holes that ſupply the place of *gills*; and under the belly a ſmall *line*, reaching from the mouth to the *exit* of its excrement; it moves

[b] *Idem. cap.* 11. [c] *De Piſcibus fluviatil. cap.* 24. [d] *Onomaſt. Zoicon. tit. Piſces, cap. Lævium.* [e] *Pinax rer. Nat. Britan. p.* 188.

by

by a *winding impulſe* of its body, without the help of any other fins but the *pinnulæ* at the tail, by which it ſteers its courſe; and thus far it agrees with the *Lampetra fluviatilis*.

28, But though they agree in ſome particulars, they differ in as many, our *Pride* being *ſtreaked* from the top of its back down to the afore-mentioned *line* at the bottom of its belly, with lines of a diſtinct colour from the reſt of its body, like the *Pricka marina* of *Aldrovandus*[f], whereof the *Lampetra* is not ſaid to have any: Beſide the two *pinnulæ* of the *Lampetra*, whereof one ſtands on the top of its *tail*, and the other a little higher on the *back*, ſome ſpace interceding; the *Pride* has another underneath its tail, joyning with the other from above at the tip, making the whole tail to end like the *head* of a *ſpear*. Moreover, the eyes of the *Pride* are very obſcure, and not ſuch plain round ones as are given the *Lampetra*, not only in the deſcription but Cut of *Rondeletius*: And though it have a *hole* in its *head*, yet it ſtands not as *Rondeletius* deſcribes it in the *Lampetra*, juſt in the middle between the *eyes*, but more forward in the extremity of the *head*, near the upper lip; all which may plainly be ſeen *Tab.* 10. *Fig.* 6, and 7. Whence 'tis eaſie to conclude, that either this *Fiſh* has not been deſcribed at all, or ſo very meanly, that there was almoſt a neceſſity of giving another, either of which I ſuppoſe will excuſe this attempt.

29. Beſide the *Pride* which we think undeſcribed, we have another ſort of *Fiſh* plentiful in the *Cherwell* (ſcarce ever found in *Iſis* but below the place where the *Rivers* joyn) that is more certainly ſo; and that a *Fiſh* of the *ſquammous* kind, which they call a *Finſcale*, ſomwhat like a *Roach*, only the *belly fins*, and the ſingle *one* at the *exit* of the excrement, and *thoſe* at the tail are much *redder* then thoſe of a *Roach*; it has alſo a full *black eye*, incompaſſed with a *yellow iris*, whereas that of a *Roch* is *red*; it is alſo a much deeper and thinner *Fiſh*, but yet neither ſo deep or thin as a *Bream*; from which alſo it differs not only in the *redneſs* of its *fins*, but in that the *ſingle fin* placed next the *exit* of its excrement, is not continued to the tail as it is in the *Bream*: Its *fins* at the *gills* are much *whiter* than the reſt, and that upon the back of a *dirty bluiſh* colour: its *ſcales*, eſpecially near the back, are of a *greeniſh yellow* colour, on which from the *gills* to the tail

[f] *Aldrovand. de Piſcibus, lib.* 4. *cap.* 13.

there

there runs a crooked line of *points*, one on each *ſcale*, as in *Tab.* 10. *Fig.* 8. The *Fiſhes* moſt like it of any deſcribed, are the *Bollerus* or *Bordeliere*, and the *Phoxini*, *Roſe* or *Roſiere* of *Rondeletius*[g]; but that they cannot be the *ſame* is plain from hence, in that the *Bordeliere* is confeſt to have no *teeth*, whereas the *Finſcale* has *teeth* as large as a *Roach*; and the *Phoxini* never to be found without *ſpawn*, or to exceed *half a foot* in length, whereas I have ſeen *Finſcales*, even in time of year when one might well have expected it, without any *ſpawn*; and ſome of them (particularly the deſcribed one, *Fig.* 8.) from the *mouth* to the *fork* of the tail a *foot long*, and four inches and a half in depth, beſide many other *differences* that might alſo be brought.

30. Which is all I have met with *extraordinary* amongſt the *ſquamous* kind of *Fiſh*, but that there is a ſort of *Chub* peculiar to the *Evenlode*, ſome ſay exceeding, all equalling the *Pearch* or *Tench* in goodneſs. And that at *Lillingſton-Lovell*, about ſix years ſince were taken two *Salmons*, one ſomwhat above, the other ſomwhat under a *yard* in length, in a ſmall *brook* (a branch of the *Ouſe*) that a man may ſtep over, little leſs (as the *river* runs) than two hundred miles from the *Sea*. How theſe *Salmons* ſhould come up ſo *high*, has been much wondered at by *ſome*, ſince ſo many *Mills* and *Locks* ſtand in the way on this *Rivulet* to hinder them: but to ſuch as have either ſeen, or but read of the *Salmon-leap* at *Kilgarran* in *Pembroke-ſhire*[h], or at *Waſſerfal* in the *Rhine*, which I ſuppoſe is much greater, and that they run up that *river* above five hundred miles to the Lake of *Zugh* in *Switzerland*[i], perhaps it may not appear ſo ſtrange; eſpecially if it be alſo conſidered, that our *Mills* and *Locks* have moſt of them *back ſtreams* and *laſhers* to carry off the water when it is too plentiful, over which the *leap* is but very inconſiderable.

31. I have met with alſo ſomwhat remarkable of our *freſh water ſhell-fiſh*, and particularly of a ſort of *Gammarus*, or *Crey-fiſh*, found in *Salford* ſtream, that do's not boil to a *brisk red* colour, but at beſt of a *dirty yellowiſh* red, which I ſuppoſe muſt be attributed to the badneſs of the water, infected with ill qualities perhaps by the *Moor* through which it paſſes, which is very agreeable to one of *Cardans* ſigns of good water: *Ubi aqua bona* (ſays he)

[g] *Rond. de Piſcibus lacuſtribus, cap.* 8. *& de fluviatilibus, cap.* 28. [h] *Camden in Pembr. & Cardigan.*
[i] *Mr.* Rays *Obſervat. Topograph. &c. p.* 430.

aſtaci debent eſſe valde rubri, cum coquantur [k] : whence 'tis eaſie to conclude (if the *Symbol* be truly put) that where they boyl of a *different* colour, the water muſt needs be *naught*.

32. I found alſo in Ponds at *Bradwell*, *Hanwell*, and *Shot-over Foreſt*, as well as in *Rivers*, the *Mytilus fluminum maximus ſubviridis*, whereof I examined ſeveral in hopes of the *Pearls* to be found in them, mention'd by Sir *Hugh Plat* in the *Appendix* to his *Jewel-houſe* of *Art* and *Nature* [l]; but I could not meet with any with *craggy rough* out ſides, in which it ſeems they are only found (*ours* being all of them *ſmooth*) and ſo loſt my labor; but I hear they are to be met with in *Buckingham-ſhire*, *Montgomery-ſhire*, and *Shrop-ſhire*, as Sir *Hugh* alſo informs us, where more fully concerning them, if this *deſign* be encouraged, and I live to *travel* and *examine* the productions of theſe *Counties*.

33. We have alſo in great plenty all the *Cochleæ fluviatiles*, or freſh-water Snails mention'd by Mr. *Liſter* [m], concerning which I can add nothing, but that his *Cochleæ faſciatæ ore ad amuſſim rotundo* (which is ſomwhat ſtrange) ſeem to be all *viviparous*, containing their young within their bodies, cover'd over with *ſhell* before their excluſion, as I found it upon examination in great numbers of *them*; and that I found moſt of them this *Summer* ſwiming above water, dead and ſtinking, which whether to be aſcribed to the *drought*, or any other *cauſe*, I am yet uncertain.

34. Amongſt the *Cochleæ marinæ*, and *fluviatiles*, I find all the *Naturaliſts* to treat of the *Cochleæ terreſtres* [n], though I think they ſhould rather be put under the title of *Reptils*; whereof we have one *ſort* met with in *Cornbury Park* by Mr. *Jacob Bobart junior*, that I find not deſcribed in any of our *Zoographers*: in ſhape (though not ſo big) like the *Turben magnus* of *Rondelet* [o], or the twelfth *Turbo* of *Aldrovandus* [p], having a long *Turbinated ſhell* rough and unequal, by reaſon of many protuberant ribs thwarting the *helical* turns of the *ſhell*, as in *Tab.* 10. *Fig.* 9. which was found alive and creeping on the graſs, but what it ſhould be I cannot divine, unleſs the ſame with the *Cagaroles* of *Spain* and *Montpellier*, mentioned by *Aldrovandus* [q], which he ſeems to deſcribe to be a

[k] *In Hippoc. de Aere Aquis & Locis, lib.* 2. *Lect.* 14. *in text.* 23. [l] Sir *Hugh Plats App. p.* 221. [m] Philoſoph. Tranſact. *Numb.* 105. [n] *Vid. Geſnerum de Cochlearum terreſt. diverſ. ſpecieb. lib.* 4. *de Aquatil. & Aldrovandum, lib* 3. *de Teſtaceis, cap.* 30. [o] *Rond. de Teſtaceis, cap.* 16. [p] *Lib.* 3. *de Teſtaceis, cap.* 30. [q] *Idem de Teſtaceis, cap.* 31

Cochlea

Cochlea terreſtris of this figure, but gives no cut of it.

35. Of other *Reptils* we have little to ſay, but that in the *Lordſhip* of *Blechington*, and all the more *Northern parts* of *Oxford-ſhire*, no *Snakes* have been ever or very rarely ſeen, in ſo much that I met with ſeveral ancient people about *Deddington* and *Banbury* that ſcarce ever ſaw a *Snake* in their lives, at leaſt not in that *Country*. And at *Blechington* 'twas confidently believed, that a *Snake* brought from any other place, and put down there, would inſtantly die, till I made the *experiment* and found no ſuch matter: Whereupon I got leave (in the abſence of the *Family*) to incloſe my *Snake* in the *Court*, before the Right Honorable the Lord *Angleſey*'s houſe, to ſee what time would produce, leaving the *Gardiner* in truſt to obſerve it ſtrictly, who found it indeed, after three weeks time *dead*, without any ſenſible external hurt.

36. How this ſhould come to paſs, is a *queſtion* indeed not eaſie to determin, but certainly it muſt not be aſcribed to the *Taliſmanical figure* of the ſtone *Ophiomorphites* to be found about *Adderbury*, and in moſt *blue clays*, whereof there are plenty in this *Country*. Since theſe are to be met with about *Oxford* too, and many other places, where there are Snakes enough. Beſide, we are informed by *Cardan*[r], that *Albertus Magnus* had a ſtone, that being naturally mark'd with the figure of a *Serpent*, had this no leſs admirable than contrary *virtue*, that if it were put into a place that was haunted with *Serpents*, it would draw them all to *it*. Much rather may we ſubſcribe to the cauſe aſſigned by *Pliny*[s], who ſeems confidently to aſſert, that the earth that is *brackiſh*, and ſtandeth much upon *Salt-peter*, is freer from *vermin* than any other. To which we may add (if need be) *Sulphur* and *Vitriol*, whereof there is plenty in theſe parts of the *County*; but whether by *one*, *two*, or *all* theſe, though we dare not pronounce, yet that it is cauſed by ſome ſuch *mineral ſteam* diſagreeable to the *Animal*, I think we may be confident.

37. Amongſt the *inhabitants* of the *Earth*, come we next to the *Quadrupeda*, whereof ſome are μονώνυχα, whole-hooft, ſuch as *Aſſes*, *Mules*, *Horſes*, of which laſt kind I met with three remarkable for their *age*; one at *Souldern*, another at *Sherbourn*, and a third at *Aſton Rowant*, each reported to be about forty years old

[r] *De Subtilitate, lib.* 7. [s] *Nat. Hiſt. lib.* 17. *cap.* 4.

apiece. And amongſt the *Quadrupeda* δίχηλα, or cloven-hooft Beaſts, there was a *Hog* at *Upper-Tadmerton*, of as ſtrange a *ſtature* as they were of *age*; being fed by one *Pargiter* to ſo extravagant a greatneſs, that he came at laſt to be near 13 hands high, as it was teſtified to me by the Reverend Mr. *Whateley*, Rector of the place, and ſeveral others who had carefully meaſured him.

38. Of *four footed Beaſts* that chew the *cud*, they have a ſort of *ſheep* eſteemed in this *Country* for their conſtantly bearing *two lambs* at a time, whence they have juſtly obtained the name, though ſomwhat an improper one, of *double Ews*. They are ſaid to have been firſt brought into this *Country* by the Worſhipful *James Uxley* of *Darnford* Eſq; where I hear they are ſtill preſerved by the Right Worſhipful Sir *Nicholas Pelham* Knight, who with one of his *daughters* (a *coheireſs*) enjoys that *Eſtate*. I heard of them alſo about *Newington* and *Dorcheſter*, and ſome other places here and there in the *County*.

39. But there are much ſtranger *ſheep*, though perhaps not ſo profitable, at *Ricot* in the Park of the Right Honorable the *Lord Norreys*, brought hither from ſome other parts of *England* or *Wales*, but now breeding *here*: Of which, ſome of them at firſt had ſix or eight horns apiece, but the number upon mixture of their generation with other *ſheep* is ſince diminiſh'd. However, there remain ſtill *two* of them with very *ſtrange heads*, having each *four horns*; one of them with two larger *ones* iſſuing from the top of its head, bending forward, and two ſide *ones* coming out from under its ears, and bending round towards its mouth, as in *Tab.* 10. *Fig.* 10. And the other having two large *horns* ſtanding prety upright on its head, and two ſide *ones* proceeding from under the ears like the former, and bending round to the cheeks, into which they would grow (and ſo in the whole *kind*) were they not prevented by being timely cut off, as in *Tab.* 10. *Fig.* 11.

40. And as theſe are remarkable for their many *horns*, there was another *ſheep* once there, that excelled all the reſt, in its being a *Unicorn*, having a ſingle horn growing almoſt in the middle of its fore-head, 21 inches long, with annulary *protuberances* round it, and a little twiſted about the middle, as in *Tab.* 10. *Fig.* 12. There was, 'tis true, another little *horn* grew on the ſame

ſame head, but ſo inconſiderable, that it was hid under the wool. This head is ſtill preſerved by the Honorable the Lord *Norreys*, and is now to be ſeen nailed up at *Ricot* on the North ſide of the *Hall*.

41. To which may be added a *Cow* of Mris. *Dunches*, of *Newington* near *Dorcheſter*, more ſtrangely prolific, than the Sheep are ſtrange in form, that whil'ſt a *Calf*, before ſhe was eleven months old produced another: which *Animals* carrying their burthen no leſs than *nine months*, we muſt either admit that ſhe took *Bull* at about ten or eleven weeks old, or that the *Cow* her ſelf was at firſt brought forth pregnant of another, as *Ariſtotle* reports a ſort of *Mice* commonly are in a certain place in *Perſia*, ἃ ὃ Περσικῆς ἐν τινὶ τόπῳ ἀναῤῥιζωμένων ἐμβρύων, τὰ θήλεα ὀφ ὠόντα φαίνεται, i. e. *that in female Mice diſſected, the female off-ſpring was found pregnant with others* [t]. The ſame again is reported by *Claudius Ælian* of the very ſame *Animals*, near the *Caſpian Sea* [u]. And *Ariſtotle* further acquaints us, that the Fiſh *Phoxini* have ſpawn when they are very little, μικροὶ ὄντες φοξῖνοι ὠήματα ἔχουσι are his very words [w], in ſo much that *Rondelet* adds, *ut periti Piſcatores cum ovis naſci affirment* [x].

42. We are informed alſo, that the ſame ſomtimes happens in more perfect *Animals*, by *Joan. Baptiſta Nierembergius*, who tells us of a certain *mare* in *Spain* that brought forth a *mule*, great of *another* [y]. And the learned and obſerving *Bartholin* [z], yet further acquaints us, that in the Pariſh of *Uleſlovia* near *Neoburg* in *Fionia*, *Joan* the wife of *Nocholas Peter*, a Huſbandman of that *Country*, was deliver'd of a *female ſtill-born* child, pregnant with another *female*, duly placed in the *womb* about a ſpan in length, with all its parts ſo perfect, that the *Grand-mother* (who diſſected the *pregnant infant*) believed it had been living.

43. But what yet comes nearer to the buſineſs, we are informed by *David Spilinbergerus*, Phyſitian of *Leutſchovia*, that in the year 1663. there was a *Cow* in *Hungary* that brought forth a *Calf* with a great belly, wherein there was found another *Calf* with all its limbs perfect [a]. How theſe things ſhould come to paſs, the learned *Bartholin* gives us his conjecture, *viz.* that in ſuch *productions* as theſe three laſt, *Nature* at firſt intended only *twins*,

[t] *Hiſt. Animal. lib. 6. cap. ult.* [u] περὶ ζώων, *lib. 17. cap. 17.* [w] *Hiſt. Anim. lib. 6. cap 13.* [x] *Rond. de Piſcib. fluviatil. cap. 28.* [y] *In Hiſt. Nat. lib. 6. cap. 2.* [z] *Hiſt. Anatom. & Med. rar. Cent. 6. Hiſt. ult. & Epiſt. Med. Cent. 3. Ep. 28.* [a] *Miſcellan. Curioſa Med. Phyſ. Germaniæ, An. 1. obſerv. 36.*

and

and that by ſome error in her procedure, *one*, of each of *theſe*, might be thruſt into the belly of the *other* (as I ſuppoſe it happened in ſome meaſure in the caſe of *Lazarus Colloredo* and his Brother *Baptiſt*[b]) over which we may eaſily allow a ſkin to be ſuperinduced. But that ever any ſuch ſecond *fætus* was brought into the world, living after the firſt, we have no *inſtance*, except this *calf* of *Newington* may paſs for *one*, which is wholly left to the *readers* judgment. For my part, I am rather inclined to believe that the *Cow* might take *Bull* at ten or eleven weeks old, that being the leſſer wonder of the two, eſpecially having lately received news out of the *Country* from an intelligent *Lady*, that the thing is not ſo ſtrange, but poſſible enough.

44. Hither alſo muſt be referr'd the three *calves* brought forth by a *cow* at one time, that I met with at *Hardwick* not far from *Biſſeter*, which though a production not frequent, yet is as much remarkable in that they became all grown *cattle*, and ſo ſtrangely *alike*, that their very *owner* himſelf ſcarce knew them aſunder, much leſs could I, though I obſerved them ſtrictly: whence I was firmly convinced, that *ſimilitude* was a concomitant as well of *Tergemini* as *Twins*, and held as well in *Brutes* as *rational Animals*.

45. Nor can I paſs by without admiration, the *Deer* of *Cornbury Park*, which before His *Majeſties* wonderful reſtoration, being (in part at leaſt) turned into a *Cony-warren*, the *Deer* upon it had all *dwarf heads*, the moſt of them irregular, as in *Tab.* 10. *Fig.* 13. but if any of them were uniform, as in *Tab.* 10. *Fig.* 14. yet they were ſtill far ſhort of growth, ſeldom exceeding 8 or 10 inches long, though the *Deer* themſelves were well enough grown, and warrantable; the two that bore thoſe *engraven heads*, being both of them two years a *Buck* at leaſt, and in all other reſpects well enough liking: which yet as ſoon as the *Warren* was deſtroyed by the preſent *Proprietor*, the Right Honorable the *Earl* of *Clarendon* came again, to have as *fair branched-heads* as any *Deer* whatever in the adjoyning Forreſt: Which *ſtrange alterations* I cannot gueſs to proceed from any other *cauſe* than the infection of the graſs by the *urin* and *crotizing* of the *Conies*, which being hot and dry muſt needs abate the moiſture of the *Deer*, which ſupplyed matter for the *fair heads* wherewith before and ſince

[b] *Tho. Bartkol. Anatom. Med. rar. Hiſt* 66.

they

they have been as well adorned, as any of their *kind.*

46. Amongſt the *Quadrupeda* πολυδάκτυλα, or *claw-footed Animals*, I met with nothing ſo ſtrange as the *rib* of a *Dog*, or ſome ſuch like *Beaſt*, ſet in a *bone* interceding two other *ribs*, that the *intercoſtal parts* were filled with it, as in *Tab.* 10. *Fig.* 15. in ſo much that if all the *ribs* were thus qualified, the whole *cheſt* of that *Animal* muſt needs be *one bone.* This was found about *Oxford*, and given me by the Right Reverend Father in God, *Thomas* Lord Biſhop of *Lincoln.* And there are *two* other *ribs* joyned in like manner, to be ſeen in the *Repoſitory* in the *Medicin School.* But I find this has happened not only to *Beaſts*, but ſomtimes to *Men*, who have been always remarkable for their *prodigious ſtrength*; whereof in their reſpective places as I meet them hereafter.

CHAP.

CHAP. VIII.

Of Men and Women.

THE ſubject matter of this *Chapter* being very narrow, extending it ſelf only to *Man*, whom God created *Male* and *Female*, and them only in his own *Image*, little lower than the *Angels*: It cannot be expected, that the *methods* of the other *Chapters* can be obſerved here, there being no new *ſpecies* of *Men* to be produced, or not ſufficiently noted already. All therefore that remains concerning them to be handled here, will be only the unuſual *Accidents* that have attended them, whereof, though I have not met with over *many* in this *County*, yet they are enough to be diſtributed into ſuch as have attended them,

either { *at or before their birth.* / *in their courſe of life.* / *in their death or grave.*

2. Before the *birth* of *Man*, the *Vagitus uterinus*, or crying of the child in the *mothers* womb, is not ordinarily to be met with, though we find many examples of the thing in *Authors*[c], to which may be added one more that lately happened at *Heyford Purcel*, where there was a child cryed very audibly in its *mothers* womb ſomtime before the *birth*. For the performance of which action, whether there be a neceſſity of the *Infants* having reſpiration whil'ſt included in the *Amnion*; or whether it may not be done without it? let the *Phyſitians* diſpute: The matter of fact ſufficeth me at preſent that there was ſuch a thing, the people being frighted with it, and expecting ſome calamity ſhould ſoon attend ſuch a *Prodigie*, pernicious (forſooth) not only to the *place* where heard, but to the *State* it ſelf. Whereas the learned *Bartholin* more rightly notes, that the ruin of *Kingdoms* depends rather on the wickedneſs of the people, living in contempt of *God* and his *Laws*, than any ſuch *vagitus*; which portends nothing but happineſs to the *Infant*, the *Mother*, and *State*

[c] Tho. Bartholin. *Hiſt. Anatom. rar. Cent.* 1. *Hiſt.* 1.

it

it ſelf: To the *Infant*, in that it is an *Index* of its ſtrength, and perfection of *Organs*; To the *Mother*, in the certainty that her child is living, and likely to promote its own *exit*; To the *State*, which is likely to be bleſt with an *able ſubject*: the *Vagitus* being nothing but ſuch an *Io Triumphe*, as *Livy*[d] reports was made by the *infant* in the *mothers* womb in *Marrucinis*, *Q. Fabius Maximus* being the fourth time, and *M. Marcellus* the third time *COSS.* So that if any thing amiſs fall out after ſuch *Vagitus*, it muſt be imputed rather to chance than deſign of *nature:* Let us but mend our *lives*, and no ſuch matters can hurt us.

3. In the *birth* of *man* it is equally ſtrange, that the *pangs* of the *woman* in the excluſion of the child have ſomtimes affected the *Abdomen* of the *husband*, which yet to ſuch as have experimented the ſecrecy of *ſympathies*, and underſtand the ſubtilty and power of *effluviums*, perhaps may not ſeem difficult: But that the *man* ſhould ſomtimes ſuffer ſuch *pains*, whil'ſt the *woman* is well, and before ſhe is in *labor*, is a *problem* I fear beyond all hopes of *ſolution*. And yet that this has happen'd to ſome *perſons* in *Oxford* is very certain, and that to knowing *ones* too, very unlikely to be deceived, and of unqueſtionable veracity: whereof *one* of them told me (*whom* I enquired of more particularly concerning *them*) that they came upon *him* when he little thought of his *wife*, and that the *pangs* were very odd *ones*, ſuch as he never felt in his life; not like any *griping* in the *guts*, but lying in the *muſcles* of the *Abdomen*, which yet he ſhould never have thought to have had relation to his *wife*, had they not ſuddenly, and beyond expectation ceaſed, as ſoon as his *wife* began to be in *labor*. Which makes much for the credit of a relation of the *German Virtuoſi*[e], concerning one *Faber* of *Buxovil* in *Alſatia*, who conſtantly acted the part of his *pregnant wife*, being taken with *vomitings*, and ſuffering thoſe inordinate *longings* that uſually attend *women* in that condition, his *wife* all the while ſuffering no ſuch *inconveniencies*.

4. That ſuch *ſymptoms* ſhould be thus tranſlated from the *woman* to the *man*, the *woman* remaining well and undiſturbed, Dr. *Primroſe*[f] thought ſo irrational (upon account that *natural Agents* firſt work on the *neareſt* objects, and then on the *remoteſt*, and

[d] T. Livii *Hiſt. ab Urbe Cond. lib.* 24. [e] *Miſcellania Curioſa Med. Phyſ. German. An.* 2. *obſerv.* 215.
[f] Jac. Primroſii *M. D. de vulgi erroribus, in Med. lib.* 2. *cap.* 13.

that therefore a *woman* muſt needs be firſt affected with her own *noxious* humors) that *he* lookt upon it as no better than a ridiculous error, as indeed I think I ſhould have done my ſelf, but that I am otherwiſe perſwaded by *ſober men*, who well know how to diſtinguiſh the manner of the *pangs*, and the circumſtances of them: Nor ſhould I have ventured to have made this relation, but that the *perſons* are living, and ready to juſtifie what I have written to any *perſon* fit to be diſcours'd with about ſuch *matters*: but how they ſhould come to paſs, is ſo hard to determin, that I dare not yet attempt it, it being difficult not to err concerning ſuch *myſteries* of *Nature*.

5. That *women* may bring forth *three* at a birth appears evidently by the example of the *Horatii*, and *Curiatii*; to whom may be added, though of unequal rank, the three children of a *Tayler* here in *Oxford*, which he had all at a birth. But to go above that number ſays *Pliny*[g], is reputed and commonly ſpoken off as *monſtrous*, and to portend ſome miſ-hap: for confirmation whereof, he inſtances in a *Commoners* wife of *Oſtia*, who was delivered at one birth of *two boys* and *two girls*; but this, ſays he, was a moſt prodigious token, and portended no doubt the *famine* that enſued ſoon after: *i. e.* It pleaſed *God* to viſit thoſe parts with *famin* about that time, there being no more dependence between the *famin* and the *preceding birth*, than there is between the *Wars*, *Plagues*, and *Famins*, that ſomtimes follow *Comets*; there having been (no queſtion) as many of *them*, to which nothing extraordinary has been ſubſequent, as to which there has; and ſo of *Births*.

6. Witneſs the *four children* brought all at a time by *Elenor* the wife of *Henry Deven* of *Watlington*, *An.* 1675. ſince which time we have yet lived (thanks be to God) in as great *health*, *peace* and *plenty*, under our good and gracious *King*, as ever People did, which *God* of his mercy continue to us; *whom* if we ſerve in ſincerity, performing unto *Him* an honeſt, faithful, and uniform obedience (though 'tis true our beſt performances will be mixed with much of weakneſs, ignorance, frailties, and recidivations) we need never to fear the *influence* of any ſuch *accidents*, though they much exceed the ordinary courſe of *nature*.

7. The ſame *Pliny*[h] informs us, that many *men* indeed have

[g] *Nat. Hiſt. lib.* 7. *cap.* 3. [h] *Nat. Hiſt. lib.* 7. *cap.* 14.

begotten

begotten *children* at ſixty or eighty years old: for which he inſtances in *Voluſius Saturninus*, who on Dame *Cornelia*, of the lineage of the *Scipio*'s, begat *Voluſius Saturninus* (who afterward was *Conſul*) at ſixty two years old and upwards. *Cato Cenſorius*, ſays the ſame *Pliny* (anceſtor to *Cato* who ſlew himſelf at *Utica*) begat a ſon on the daughter of *Salonius* his Vaſſal, after he was paſt 80 years of age; and King *Maſſiniſſa*, another, whom he called *Methymathnus*, when he was eighty ſix. But as to *women*, he is poſitive that they are paſt *child-bearing* at fifty, and that for the moſt part their *cuſtomary purgations* ſtop at forty.

8. But I met with an inſtance at *Shetford* near *Banbury*, that proves him plainly miſtaken, where I ſaw and ſpoke with one *Catharine Tayler*, that had a *ſon* then living and luſty, in the ſixtieth year of her age, which was teſtified alſo to me by many there about. And I have ſince heard of one Goodwife *Harvey* of *Smithen-green*, in the Pariſh of *Leigh*, within three miles of *Worceſter*, that is now with child in her *ſixty third* year, which are inſtances wonderful rare, and ſcarce heard of in other *Countrys*; though we are informed indeed by Dr. *Boat*[i], that amongſt the women in *Ireland*, there are ſeveral found who do not only retain their *Catamenia*, but even their fruitfulneſs, above the age of *fifty*, and ſome till that of *ſixty* years; whereof he tells us, his *brother* knew ſome, who being above *threeſcore* years old, did not only conceive and bring forth children, but nurſed them, and brought them up with their own milk: which alſo as we are acquainted by *Gul. Piſo* *, is very common in *Braſil*.

9. As in the *child-bearing* of *women*, and the *accidents* attending it, I have met with alſo ſomwhat extraordinary in their *growth*, which muſt be ranked among the *accidents* that have befallen the *ſex* during their *courſe* of *life*; and ſuch is the growth of one *Philippa French*, born at *Milcomb* in this *County*, now ſix or ſeven and thirty years of age, and a marryed *woman*, having all her parts proportionable, and of good *ſymmetry*, yet wanting half an *inch* of a *yard* in *height*: which is ſomwhat lower than *Manius Maximus*, or *M. Tullius*, who as *Varro* reports, were each but *two cubits* high, and yet they were *Gentlemen* and *Knights* of *Rome*: but higher then *Conopas* the Dwarf of *Julia*, Neece to *Auguſtus*,

[i] Natural Hiſtory of *Ireland*, *chap.* 23. *ſect.* 1. * Gul. Piſo, *de Indiæ utriuſque re Nat. & Med. lib.* 1. *cap.* 1. *p.* 13

who as *Pliny*[k] tells us, was but *two foot* high and a *hand bredth*; but he tells us not whether *Conopas* were at his full growth, or had good *ſymmetry* of parts like our *Philippa*, it being common enough for perſons to be very low of ſtature, when either their Bodies are awry, or ſome of their parts diſproportionable to the reſt.

10. And amongſt ſuch *accidents* as theſe, we may reckon a ſtrange *diſeaſe* that befel *Mary* the daughter of *John Collier* of *Burford*, who out of the corners of her *eyes* excluded a ſort of *congealed* matter, which after ſome time turned into a *ſtony* kind of *ſubſtance*, not unlike the *ſtones*, as they were deſcribed to me, that ſometimes come forth of the tumor called *Atheroma:* which I therefore gueſs to have been only a more exalted kind of *Ægilops*, or *fiſtula lachrymalis*, and not to have been cauſed by *faſcination*, as *Lachmund*[l] thinks the *ſtones* were that came forth of the left eye of *Margaret* the daughter of *Conrad Brandis* of *Banteln*, ſhe being cured of the *diſeaſe* by that eminent *Oculiſt* Dr. *Turbervil* of *Sarum*.

11. Yet a much ſtranger *accident* than *that* befel one *Rebeckah Smith*, the Servant-maid of one *Thomas White* of *Minſter Lovel*, who being of a robuſt conſtitution, though *ſhe* ſeldom eat fleſh (it ſcarce agreeing with her) and above 50 years of age; after *ſhe* came from the *Communion* on *Palm-ſunday*, *April* 16. *Anno* 1671. was taken with ſuch a dryneſs in her throat, that ſhe could not ſwallow her *ſpittle*, nor any thing elſe to ſupply the decays of *nature*: and in this caſe *ſhe* continued without eating or drinking, to the amazement of all, for about *ten weeks*, *viz.* to the 29 of *June*, being both St. *Peters*, and *Witney-fair* day: by which time being brought very low, her *maſter* enquired and found out a *perſon* who gave him an *Amulet* (for it was ſuppoſed *ſhe* was bewitch'd) againſt this *evil*; after the application whereof, within two or three days time (though I dare not ſuppoſe there was any dependence between the *medicin* and *diſeaſe*) ſhe firſt drank a little *water*, then warm *broaths* in ſmall quantities at a time, and nothing elſe till *Palm-ſunday* again *twelve months* after, when ſhe began to eat bread and other food again as formerly ſhe had done, and is now about the age of *ſixty*, and ſtill *living* at the ſame place ready to teſtifie the truth of the thing, as well as *Tho. White* and

[k] *Nat. Hiſt. lib.* 7. *cap.* 16. [l] Fred. Lachmundi, Ὀφυπτρχφ. *ſect.* 3 *cap.* 22.

his

his *wife*, who were all that lived in the houſe with her, and will confidently aſſert (for they carefully obſerved) that they do not believe ſhe ever took any thing in thoſe *ten weeks* time, nor any thing more all the *year* following but what was above-mentioned: wherein I think they may the rather be credited, becauſe there was never any *advantage* made of this *wonder*, which argues it clear of all *juggle* or *deſign*.

12. Concerning the death of *women*, we have two as remarkable *examples*, as any perhaps to be met with in *Hiſtory*, both of them being confirmations of what *Pliny* ſays of them, that they much more frequently *revive* after they have been reputed dead, than *males* do *, whence doubtleſs alſo the *Proverb*, *mulieri ne credas, ne mortuæ quidem*. Of which recoveries of the *female* Sex rather than the *male*, the ſame *Pliny* offers us a *natural* reaſon, but I think fit to wave it, eſpecially ſince the *reviviſcence* of *Anne Green*, innocently condemned to dye, and executed at *Oxford* for the murther of an *abortive* Infant, is rather aſcribed to the *Juſtice* of *Heaven*, than to the ſtrength or other conveniencies of *nature* for ſuch purpoſe in *women* rather than *men*, though it muſt alſo be allowed, that *God* Himſelf makes uſe many times of *natural* means in production of the moſt wonderful, moſt amazing *effects*. The *Hiſtory* whereof, as it is taken out of a *Chronicle* of the late *Civil Wars*, by *James Heath* Gentleman [m], and the continuation of the *Hiſtory* of the *World*, by *Dionyſius Petavius* [n], with ſome few additions and alterations, take as followeth.

13. In the year 1650. this *Anne Green*, being a Servant-maid of the Right Worſhipful Sir *Thomas Read* of *Duns Tew* in *Oxfordſhire*, was gotten with child by ſome *ſervant*, or other of the family (as *ſhe* conſtantly affirmed when *ſhe* had little reaſon to lye) and through over-working *her ſelf* in turning of *mault*, fell in travel about the *fourth* month of her *time*: But being but a young wench, and not knowing what the matter might be, repairs to the houſe of *eaſment*, where after ſome ſtraining, the *child* (ſcarce above a ſpan long, of what *ſex* not to be diſtinguiſh'd) fell from *her* unawares. Now preſently after, there appearing ſigns of ſome ſuch matter in the *linnen* where ſhe lay, and *ſhe* before having confeſt, that ſhe had been guilty of what might occaſion

* *Hiſt. Nat lib. 7. cap. 52.* [m] Hiſtory of the Civil Wars of *England*, *Scotland*, and *Ireland*, in *Anno* 1650. [n] *Append. ad Hiſt. D. Petavii, in Anno* 1650.

her

her being with child, a ſearch inſtantly was made, and the Infant found on the top of the *ordure*.

14. Whereupon, within three days after *her* delivery, *ſhe* was conveyed to the *Caſtle* at *Oxford*, where forthwith (an *Aſſiſe* being purchaſed on purpoſe) ſhe was arraigned before Serjeant *Umpton Croke*, then living but at *Marſton*, who ſat as *Judge* by a Commiſſion of *Oyer* and *Terminer*, and by *him* ſentenced to be hanged; which was accordingly executed on the fourteenth of *December* in the ſaid *Caſtle-yard*, where ſhe hung about half an hour, being *pulled* by the legs, and *ſtruck* on the breſt (as ſhe her ſelf deſired) by divers of her *friends*; and after all, had ſeveral ſtroaks given her on the ſtomach with the but-end of a Soldiers Muſket. Being cut down, ſhe was put into a *coffin*, and brought away to a houſe to be *diſſected*, where when they opened it, notwithſtanding the *rope* ſtill remained *unloſed*, and *ſtraight* about her neck, they perceived her *breſt* to riſe; whereupon one *Maſon* a *Tayler*, intending only an act of charity, ſet his foot upon her breſt and belly; and as ſome ſay, one *Orum* a Soldier ſtruck her again with the but-end of his *musket*.

15. Notwithſtanding all which, when the learned and ingenious, Sir *William Petty*, then *Anatomy Profeſſor* of the *Univerſity*, Dr. *Willis*, and Dr. *Clark* now Preſident of *Magdalen College*, and *Vice-Chancellor* of the *Univerſity*, came to prepare the *body* for *diſſection*, they perceived ſome ſmall ratling in her throat; hereupon deſiſting from their former purpoſe, they preſently uſed means for her recovery, by opening a *vein*, laying her in a *warm bed*, and cauſing another to go into bed to *her*; alſo uſing divers *remedies* reſpecting her *ſenſeleſsneſs*, *Head*, *Throat*, and *Breſt*, in ſo much that within 14 hours, *ſhe* began to ſpeak, and the next day talked and prayed very heartily.

16. During the time of this her recovering, the *officers* concerned in her *execution*, would needs have had her away again to have compleated it on her: but by the mediation of the *worthy Doctors*, and ſome other *Friends*, with the then *Governor* of the *City*, Colonel *Kelſey*, there was a guard ſet upon *her* to hinder all further diſturbance, till he had ſued out her *pardon* from the *Powers* then in being; thouſands of people in the mean time coming to ſee *her*, and magnifying the juſt Providence of *God* in thus aſſerting her innocency of *murther*.

After

17. After ſome time Dr. *Petty* hearing *ſhe* had diſcourſed with thoſe about *her*, and ſuſpecting that the *women* might ſuggeſt unto *her* to relate ſomthing of ſtrange *viſions* and *apparitions* ſhe had ſeen, during the time ſhe ſeemed to be *dead* (which *they* already had begun to do, telling about that *ſhe* ſaid, *ſhe* had been in a fine *green meddow*, having a *River* running round it, and that all things there glittered like *ſilver* and *gold*) *he* cauſed all to depart the *room* but the *Gentlemen* of the *Faculty*, who were to have been at the *diſſection*, and aſked her concerning her *ſenſe* and *apprehenſions* during the time ſhe was hanged.

18. To which ſhe anſwered at firſt ſomwhat *impertinently*, talking as if *ſhe* had been then to *ſuffer*. And when they ſpake unto her concerning her *miraculous deliverance*, *ſhe* anſwered, that *ſhe* hoped *God* would give her *patience*, and the like: Afterward, when *ſhe* was better recovered, *ſhe* affirmed, that *ſhe* neither remembred how the *fetters* were knocked off, how *ſhe* went out of the *Priſon*; when *ſhe* was turned off the *ladder*, whether any *Pſalm* was ſung or not, nor was *ſhe* ſenſible of any *pains* that *ſhe* could remember: what is moſt obſervable is, that ſhe came to *her ſelf* as if *ſhe* had awakened out of a *ſleep*, not recovering the uſe of her *ſpeech* by ſlow degrees, but in a manner all together, beginning to ſpeak juſt where ſhe left off on the *gallows*.

19. Being thus at length perfectly recovered, after *thanks* given to *God*, and the *perſons* inſtrumental in it, *ſhe* retired into the *Country* to her *friends* at *Steeple-Barton*, where ſhe was afterwards *marryed*, and lived in good repute amongſt her *Neighbors*, having *three* Children afterwards, and not dying as I am informed till the *year* 1659. Which *occurrence* being thought worthy of remembrance by the *Author* of the continuation of the *Hiſtory* of the *World*, by *Dionyſius Petavius*, who eſteemed it no leſs than the finger of *God* pointing out the *Maids* innocency; and by Mr. *Heath*, who thought fit to tranſmit it to poſterity for *Gods* glory, and *mans* caution in judging and puniſhing. It would have been a great *omiſſion* in me to have paſſed it by untouched.

20. Not long after, *viz.* in the *year* 1658. *Elizabeth* the ſervant of one Mrs. *Cope* of *Magdalen Pariſh Oxon*, was indicted at the *City Seſſions* for killing her baſtard child, and putting it in the houſe of *office*; of which being convicted, *ſhe* was condemned to dye, and accordingly was hanged at *green-ditch*, the place

ap-

appointed for the *execution* of the *City malefactors*, where ſhe hung ſo long, that one of the by-ſtanders ſcrupled not to ſay, that if ſhe were not *dead*, he would be *hanged* for her: hereupon being cut down (the *gallows* being very high) ſhe fell with ſuch violence on the ground, that it would have been enough to have been the death of many another *perſon*, only to have had ſuch a fall. Being thus cut down, *ſhe* was put into a *coffin* and brought to the *George Inn* in *Magdalen Pariſh* aforeſaid, which when opened, they found perfect life in *her*, as in the former: whereupon breathing a *vein*, and putting her to *bed* with another *young* wench by *her*, *ſhe* came quickly to *her ſelf*, and might no queſtion have lived alſo many *years* after; but having no *friends* to appear for *her*, *ſhe* was barbarouſly dragg'd the night following by the order of one *Mallory* then one of the *Bayliffs* of the *City*, to *Gloceſter-green*, and there drawn up over one of the arms of the *Trees*, and hang'd a ſecond time till ſhe was dead.

21. After what concerns *women* ſolitarily conſider'd, who according to the courteſie of *England*, have always the firſt place, come we next to treat of things unuſual that concern *women* and *men* joyntly together; amongſt which I think we may reckon many ancient *Cuſtoms* ſtill retained *here*, aboliſh'd and quite loſt in moſt other *Counties*: ſuch as that of *Running* at the *Quinten*, *Quintain*, or *Quintel*, ſo called from the *Latin* [*Quintus*] becauſe ſays *Minſheu* °, it was one of the *Ancient Sports* uſed every fifth year amongſt the *Olympian games*, rather perhaps becauſe it was the *laſt* of the πένταθλοι, or the *quinque certamina gymnaſtica*, uſed on the *fifth* or *laſt* day of the *Olympicks*. How the manner of it was *then* I do not find, but *now* it is thus.

22. They firſt ſet a *Poſt* perpendicularly into the ground, and then place a ſlender piece of *Timber* on the top of it on a *ſpindle*, with a *board* nailed to it on one end, and a *bag* of *ſand* hanging at the other; againſt this *board* they anciently rod with *ſpears*; now as I ſaw it at *Deddington* in this *County*, only with *ſtrong ſtaves*, which violently bringing about the *bag* of *ſand*, if they make not good ſpeed away it ſtrikes *them* in the neck or ſhoulders, and ſometimes perhaps knocks *them* from their *horſes*; the great deſign of the *ſport* being to try the agility both of *horſe* and *man*, and to break the *board*, which whoever do's, is for that time accounted *Princeps Juventutis*.

° Minsh. ἡμιῶν εἰς τὰς γλώσσας, *in verbo.*

23. For

23. For *whom* heretofore there was ſome reward always appointed, *Eo tempore* (ſays *Matthew Paris*) *Juvenes* Londinenſes, *ſtatuto Pavone pro bravio, ad Stadium quod Quintena vulgariter dicitur, vires proprias, & Equorum curſus, ſunt experti*: Wherein it ſeems the *Kings ſervants* oppoſing *them* were ſorely beaten; for which, upon complaint, the *King* fined the *City*[p]. Whence one may gather that it was once a tryal of *Man-hood* between two *parties*; ſince that, a conteſt amongſt *friends* who ſhould wear the *gay garland*, but now only in requeſt at *Marriages*, and ſet up in the way for *young men* to ride at as they carry home the *Bride*, he that breaks the board being counted the *beſt man*.

24. To which may be added the obſervation of *Hoc-day*, *Hock-day*, *Hoke-day*, *Hoke-tide*, *Hoke-Monday* and *Hoke-Tueſday*: by all agreed to be a *Feſtival* celebrated in memory of the great ſlaughter of the *Danes* in the time of King *Ethelred*, they being all ſlain throughout *England* in one day, and in great part by *women*[q]; whence it came to paſs, that the *women* to this day bear the chief rule in this *Feaſt*, ſtopping all paſſages with *ropes* and *chains*, and laying hold on *paſſengers*, and exacting ſome ſmall matter of them, with part whereof they *make merry*, and part they diſpoſe of to *pious uſes*, ſuch as reparation of their *Church*, *&c.*

25. For which very reaſon ſome have thought it to be called *Hoke-Tide*, from the *German* or *High-Dutch*, Hoge zeit, *i.e. Tempus Convivii*, a time of Feaſting; or the *Saxon* hoegen, which ſignifies a *Solemn Feaſt*; or perhaps rather from the *Anglo-Saxon*, heage tis, *i. e.* a *high Time*, or *high Day*: *Others* that thought the name reſpected the contempt that the *Danes* now lay under, amongſt whom is Mr. *Lambard*, thought it ſo called, *quaſi* Ducxtuerdæg, *i. e. Dies Martis irriſorius*[r], perhaps rather from Dogian *temnere*: And *others*, that reſpected the manner of the celebration of the *Feaſt*, choſe rather to derive it from the *German* Hocken, which ſignifies *obſidere*, *cingere*, *incubare*[s], to compaſs about, lay hold off, *&c.* as the *women* do on the *men* upon this day.

26. And as about the *name*, ſo about the *time Authors* differ much, ſome making *Hoke-day* to be the *Tueſday*, and others the *Monday* fourteenth night after *Eaſter*, and none of them on the

[p] *Matth. Paris ſub initium An.* 1253. *edit Watſianâ, p.* 863. [q] *Vid. Watſii Gloſſarium in Mat. Paris.*
[r] Perambulation of *Kent*, in *Sandwich*. [s] *Vid. Spelman. Gloſſarium in verbo.*

Danes maſſacre, which *Henry* Arch-Deacon of *Huntingdon*[t] expreſly ſays was on the Feaſt of St. *Brice*, *i. e.* the 13 of *November*. That it was formerly obſerved on *Tueſday*, not only Mr. *Lambard*, *ut ſupra*, but *Matthew Paris* alſo gives us teſtimony, *Et poſt Diem Martis quæ vulgariter* Hoke-day *appellatur*, *factum eſt Parliamentum* Londini, *&c*[u]. And yet the ſame *Matthew Paris* in another place makes it to fall on the *Quinſieme* of *Eaſter*, in *Quindena Paſchæ quæ vulgariter* Hoke-day *appellatur convenerunt* Londini, *&c*[w]. which muſt needs be *Munday* ; and the very ſame day it is obſerved here at *Oxford* in our times.

27. In ſo much that I once thought they might *anciently*, as well as *now*, obſerve two *Hock-days*, one for the *women*, and another for the *men*, but that I find the ſame *Matthew Paris* to mention the *Monday* before *Hoke-Tueſday*, and not calling it a *Hock-day* at all ; *viz.* *Anno* 1252. where mentioning King *Henry* the *thirds* taking on him the *Cruſado*, he ſays, he did it *die Lunæ*, *quæ ipſum diem proxime præcedit quem* Hoke-day *appellamus*[x]. However it were *then*, it is moſt certain that *now* we obſerve *two* of them here, on *Monday* for the *women*, which is much the more ſolemn, and *Tueſday* for the *men* which is very inconſiderable ; and yet neither of theſe perhaps was the *dies Martis ligatoria*, whatever Sir *Henry Spelman* may think[y], whereon *men* and *women* uſe to *bind* one another, that being now celebrated in ſome parts of *England* on *Shrove Tueſday* : Much leſs the ſame with the Feaſt of St. *Blaſe*, as *Minſheu*[z] thinks, when *Country women* went about and made good cheer, and if they found any of their *Neighbor-women* a Spinning, ſet their *diſtaff* on fire ; that Feaſt being celebrated on the third of *February*, and in all probability upon ſome other grounds.

28. Amongſt things of this nature, I think we may alſo reckon an ancient *Cuſtom* of the *Royalty* of *Enſham*, where it was formerly allowed to the Towns-people on *Whit-monday*, to cut down and bring away, where-ever the *Church-wardens* pleaſed to mark it out, by giving the firſt chop, as much *Timber* as could be drawn by *mens* hands into the *Abbey-yard*, whence if they could draw it out again, notwithſtanding all the *impediments* could be given the *Cart* by the *ſervants* of the *Abbey* (and ſince that by the *family*

[t] *Hiſtoriarum Libro* 6. *ſub initium*. [u] *Matth. Paris in An.* 1258. *edit. Watſ. p.* 963. [w] *Idem in An.* 1255. *edit. Watſ. p.* 904. [x] *Matth. Paris edit. Watſ. p.* 834. [y] *Vid. Spelman Gloſſarium in verbo.* [z] *Minſh.* ῥαμμὴν εἰς τὰς γλώσσας, *in verbo.*

of

of the *Lord*, it was then their own, and went in part at leaſt to the *reparation* of their *Church*; and by this, as ſome will have it, they hold both their *Lammas* and *Michaelmas Common*. But this *Cuſtom*, now the *Timber* is almoſt deſtroyed thereabout, begins to be ſo inconvenient, that if it be not ſeaſonably laid aſide, it will diſcourage all people from *planting* it again, even about their very *houſes*: for to what purpoſe ſhould they do it, when it would ſtill be in the power of a malicious *Church-warden* to give it a chop, and deſtroy it when he pleaſes. To prevent which great evil, I hear the chiefeſt of the *Pariſh* have lately combined, wherein I think they have done well enough, provided always that the Rights of the *Church* (whatever they be) be fully compenſated ſome other way.

29. In the *Northern* part of *Oxford-ſhire*, about *Banbury* and *Bloxham*, it has always been the *cuſtom* at ſet times of year, for young people to meet to be hired as *ſervants*; which meeting, at *Banbury* they call the *Mop*; at *Bloxham* the *Statute*, where they all ſort themſelves, and carry their *badges* according as they are qualified; the *Carters* ſtanding in one place with their *whips*, and the *Shepherds* in another with their *crooks*; but the *maids*, as far as I could obſerve, ſtood promiſcuouſly: which *cuſtom* I had ſcarce I think noted, but that it ſeems to be as *old* as our *Saviour*, and to illuſtrate his *Parable* in St. *Matthews Goſpel* [a], where the *laborers* are ſaid to ſtand in the *mercat* to be hired.

30. And now I have run my ſelf into *Divinity*, I cannot but note an odd *cuſtom* at *Stanlake*, where the *Parſon* in the Proceſſion about *holy Thurſday*, reads a *Goſpel* at a Barrels head in the *Cellar* of the *Chequer Inn*, where ſome ſay there was formerly a *Hermitage*; others, that there was anciently a *Croſs*, at which they read a *Goſpel* in former times, over which now the *houſe*, and particularly the *cellar* being built, they are forced to perform it in manner as above.

31. But in matters of *Religion* there is nothing ſo worthy memory as the *Chriſtian unanimity* of the Pariſh of *Brightwell*, where, through the exemplary Piety, and prudent conduct of that worthy Gentleman, the Worſhipful *John Stone* Eſq; Lord of the *Town*, and the Reverend Mr. *Fiddës*, *Rector* of the place, and their *Predeceſſors*, and the good diſpoſition of the *people* them-

[a] *Matth.* 20. *v.* 3.

ſelves, all matters both of Spiritual and Temporal concern, have been ſo effectually preſs'd, and prudently menaged, that there has not been known any ſuch thing as an *Ale-houſe*, a *Sectary*, or *Suit of Law* commenced within the whole *pariſh* (which is of a large extent) in the memory of *man*: which being more for ought I know than any Pariſh in *England* can ſay beſide, and ſo well worthy the imitation of all other *places*, I thought fit (for the eternal honor of its *Inhabitants*) to recommend it accordingly.

32. Yet but few miles off, at the *Town* of *Watlington*, I was told of a ſort of *Sectaries*, perhaps never heard of in the *world* before; which if ſo, is as ſtrange as the thing it ſelf, for *one* would have thought there could have nothing been ſo abſurd in *Religion*, but what muſt have needs been embraced already. Theſe by the reſt of the *people* are called *Anointers*, from the *ceremony* they uſe of *anointing* all perſons before they admit them into their *Church*, for which they allege the fifth of St. *James*, *v.* the 14 and 15. *Is there any ſick among you* (which it ſeems they account all people to be but themſelves) *let him call for the Elders of the Church, and let them pray over him, anointing him with oyl in the name of the Lord; and the prayer of faith ſhall ſave the ſick, and the Lord ſhall raiſe him up, and if he have committed ſins they ſhall be forgiven him*: which *Elders* amongſt them are ſome poor *Tradeſmen* of the *Town*, and the *oyl* they uſe, that commonly ſold in the *ſhops*, with which the *Proſelyte* being ſmeared over, and fired with *zeal*, he preſently becomes a new *Light* of this *Church*; which I could not but note, theſe *people* being as remarkably *mad*, as thoſe of *Brightwell* are *good*. Though perhaps ſome may think one *Richard Haſtings*, then of *Broughton*, and yet living near *Banbury*, more religiouſly *mad* than any of thoſe; who with *Origen* underſtanding the twelfth verſe of the nineteenth *Chapter* of St. *Matthews Goſpel* literally, hath caſtrated, and ſo made himſelf an *Eunuch* for the Kingdom of Heavens ſake.

33. And thus much of *men* and *women* jointly together in their *lives*; as to what concerns their *deaths*, I muſt add alſo a *Relation*, *as* ſtrange as 'tis true, of the Family of one Captain *Wood* late of *Bampton*, now *Briſe-Norton*, Captain in the late Wars for the *King*; Some whereof before their *deaths* have had ſignal warning given them by a certain *knocking*, either at the *door* without, or on the *table* or *ſhelves* within; the *number* of ſtroaks,

and

and distance between them, and the *place* where, for the most part respecting the circumstances of the *persons* to dye, or their *deaths* themselves, as will easily be collected from the following relation.

34. The first *knocking* that was heard, or at least observed, was about a year after the restoration of the *King*, in the afternoon a little before night, at or upon the *door* it being then open, as it was apprehended by Mrs. *Elenor Wood*, mother to Captain *Basil Wood*, who only heard it, none being then by or about the *house* but her self; at which she was very much disturbed, thinking it boded some ill to *her* or *hers*, and within fourteen nights after, she had news of the death of her Son in law Mr. *George Smith*, who dyed in *London*.

35. About three years after that, there were three great *knocks* given very audibly to all that were then in the *house*, *viz.* to the aforesaid Mrs. *Elenor Wood*, Mr. *Basil Wood*, and his wife Mrs. *Hester*, and some *servants:* which *knocks* were so remarkable, that one of the *maids* came from the *well* which was about twenty yards from the place, to see what was the matter; and Mrs. *Elenor Wood*, and another maid that was within the *house*, saw three great pans of *Lard* shake and totter so upon a shelf in the *Milk-house*, that they were like to fall down. Upon this violent *knocking*, Mr. *Basil Wood* and his *wife* being then in the *hall*, came presently into the *milk-house* to their mother, where finding her somwhat disturbed, and enquiring the reason, *she* replyed, *God Almighty* only knew the matter, *she* could tell nothing but *she* heard the *knocking*; which being within doors, Mr. *Basil Wood* concluded must be for some of the Family at *home*, that upon the *door* being for a friend *abroad*: which accordingly fell out, *three* of the *family*, according to the number of the *knocks*, dying within little more than half a year after; *viz.* Mrs. *Hester Wood* wife to Mr. *Basil Wood*, a child of Mr. *Woods* sister, and Mrs. *Elenor Wood* his *mother*.

36. About *August*, 1674. Mr. *Basil Wood junior*, son of *Basil* aforesaid, living at *Exeter* in *Devon-shire*, heard the same kind of *knocking*, at which being disturbed, he wrote word of it to his *Father* here at *Bampton* in *Oxford-shire*; *viz.* That *one* Sunday, *he* and his *wife*, and her *sister*, and his *brother*, did distinctly hear upon a *Table* in their Chamber as they stood by it, two several

veral *knocks* ſtruck as it were with a *cudgel*, one of them before, and the other after *Morning-prayer*, a little before *dinner*: which Letter was ſhewn by Mr. *Wood ſenior* (as the other *knockings* before the deaths of any that dyed, were before-hand told) to ſeveral neighboring *Gentlemen*. After which, within about fourteen days, Mrs. *Heſter Wood* a ſecond wife of Mr. *Baſil Wood ſenior*, and about a quarter of a year after, her Father Mr. *Richard Liſſet*, dyed both at *Bampton*; ſince which time they have heard nothing more as yet.

37. Amongſt ſuch unaccountable things as theſe, we may reckon the ſtrange paſſages that happened at *Woodſtock* in *Anno* 1649. in the *Manor*-houſe there, when the *Commiſſioners* for ſurveying the *Manor-houſe*, *Park*, *Deer*, *Woods*, and other the *Demeaſnes* belonging to that *Manor*, ſat and lodged there: whereof having ſeveral *relations* put into my hands, and one of them written by a learned and faithful *perſon* then living upon the place, which being confirmed to me by ſeveral *eye-witneſſes* of many of the particulars, and all of them by one of the *Commiſſioners* themſelves, who ingeniouſly confeſt to me, that he could not deny but what was written by that *perſon* above-mention'd was all true; I was prevailed on at laſt to make the *relation* publick (though I muſt confeſs I have no eſteem for ſuch kind of *ſtories*, many of them no queſtion being performed by combination) which I have taken care to do as fully, yet as briefly as may be.

38. *October* the 13. 1649. the *Commiſſioners* with their ſervants being come to the *Manor-houſe*, they took up their Lodging in the *Kings* own rooms, the *Bed-chamber* and *with-drawing Room*; the former whereof they alſo made their *Kitchin*; the *Council-hall*, their *brew-houſe*; the *Chamber* of *Preſence*, their place of ſitting to diſpatch buſineſs; and a *wood-houſe* of the *Dining-room*, where they laid the *wood* of that ancient *Standard* in the *high-Park*, known of all by the name of the *Kings Oak*, which (that nothing might remain that had the name of *King* affixed to it) they digged up by the *roots*. *October* the 14 and 15 they had little diſturbance, but on the 16 there came as they thought, ſomwhat into the *Bed-chamber* where two of the *Commiſſioners* and their *ſervants* lay, in the ſhape of a *dog*, which going under their *beds*, did as it were gnaw the bed-cords; but on the morrow finding

finding them whole, and a quarter of Beef which lay on the ground untouched, they began to entertain other thoughts.

39. *Octob.* 17. Somthing to their thinking removed all the *wood* of the *Kings Oak* out of the *dining-room* into the *Preſence Chamber*, and hurled the chairs and ſtools up and down that *room*: From whence it came into the two *Chambers* where the *Commiſſioners* and their *ſervants* lay, and hoiſted up their *beds feet* ſo much higher than the *heads*, that they thought they ſhould have been turned over and over, and then let them fall down with ſuch a force, that their *bodies* rebounded from the bed a good diſtance, and then ſhook the *bed-ſteds* ſo violently, that *themſelves* confeſt their *bodies* were ſore with it. *October* 18. Somthing came into the *Bed-chamber* and walkt up and down, and fetching the *warming-pan* out of the *with-drawing room*, made ſo much noiſe that they thought five *bells* could not have made more. And *October* 19. *Trenchers* were thrown up and down the *dining-room* and at them that lodg'd there, whereof one of them being ſhaken by the ſhoulder and awakened, put forth his head to ſee what was the matter, but had *trenchers* thrown at it. *October* 20. the *curtains* of the *bed* in the *with-drawing room* were drawn to and fro, and the *bedſted* much ſhaken, and eight great *pewter diſhes*, and three dozen of *trenchers*, thrown about the *bed-chamber* again, whereof ſome fell upon the *beds*: this night they alſo thought whole arm-fulls of the *wood* of the *Kings* Oak had been thrown down in their *chambers*; but of that, in the morning they found nothing had been moved.

40. *October* 21. The *keeper* of their *Ordnary* and his *bitch*, lay in one of the *rooms* with them, which night they were not diſturbed at all. But *October* 22. though the *bitch* kennel'd there again (to whom they aſcribed their former nights reſt) both they and the *bitch* were in a pitiful taking; the *bitch* opening but once, and that with a *whining*, *fearful* yelp. *October* 23. they had all their cloaths pluckt off them in the *with-drawing room*, and the *bricks* fell out of the chimney into the *room*; and the 24th they thought in the *dining-room* that all the *wood* of the *Kings* Oak had been brought thither, and thrown down cloſe by their *bed*-ſide, which noiſe being heard by thoſe of the *with-drawing room*, one of them roſe to ſee what was done, fearing indeed that his fellow *Commiſſioners* had been killed, but found no ſuch matter; where-

whereupon returning to his *bed* again, he found two dozen of *trenchers* thrown into it, and handſomly covered with the bed-cloaths.

41. *October* 25. The *curtains* of the *bed* in the *with-drawing room* were drawn to and fro, and the *bedſted* ſhaken as before: and in the *bed-chamber* glaſs flew about ſo thick (and yet not a pane of the *chamber* windows broken) that they thought it had rained *money*; whereupon they lighted candles, but to their grief they found nothing but *glaſs*, which they took up in the morning and laid together. *October* 29. Somthing walked in the *with-drawing room* about an hour, and going to the *window* opened and ſhut it; then going into the *bed-chamber*, it threw *great ſtones* for about half an hours time, ſome whereof lighted on the *high-bed*, and others on the *truckle-bed*, to the number in all of about four-ſcore. This *night* there was alſo a very great noiſe, as though forty *pieces* of *Ordnance* had been ſhot off together; at two ſeveral *knocks* it aſtoniſhed all the *neighboring dwellers*, which 'tis thought might have been heard a great way off. During theſe *noiſes* which were heard in both *rooms* together, both *Commiſſioners* and *ſervants* were ſtruck with ſo great horror, that they cryed out to one another for help, whereof *one* of them recovering *himſelf* out of a ſtrange *agony* he had been in, ſnatch'd up a *ſword*, and had like to have killed one of his *Brethren* coming out of his bed in his ſhirt, whom he took for the *Spirit* that did the miſchief: However, at length they got all together, yet the noiſe continued ſo great and terrible, and ſhook the *walls* ſo much, that they thought the whole *Manor* would have fell on their heads. At its departure it took all the *glaſs* away with it.

42. *November* 1. Somthing as they thought walk'd up and down the *with-drawing room*, and then made a noiſe in the *dining-room*: The *ſtones* that were left before and laid up in the *with-drawing-room*, were all fetch'd away this night, and a great deal of *glaſs* (not like the former) thrown about again. *November* 2. came ſomthing into the *with-drawing room* treading (as they conceived) much like a *Bear*, which firſt only walking about a quarter of an hour, at length it made a noiſe about the *Table*, and threw the *warming-pan* ſo violently, that it quite ſpoiled it: It threw alſo *glaſs* and *great ſtones* at them again, and the *bones* of *horſes*, and all ſo violently, that the *bedſted* and *walls* were bruiſed by

by them. This night they ſet *candles* all about the *rooms*, and made *fires* up to the mantle-trees of the *chimneys*; but all were put out no body knew how, the *fire*, and *billets* that made it, being thrown up and down the *rooms*; the *curtains* torn with the *rods* from their *beds*, and the *bed-poſts* pull'd away, that the *teſter* fell down upon them, and the feet of the *bedſted* cloven in two: And upon the *ſervants* in the *truckle-bed*, who lay all this time ſweating for fear, there was firſt a little, which made them begin to ſtir; but before they could get out, there came a whole *coule*, as it were, of ſtinking *ditch-water* down upon them, ſo *green*, that it made their *ſhirts* and *ſheets* of that colour too.

43. The ſame night the *windows* were all broke by throwing of *ſtones*, and there was moſt terrible noiſes in three ſeveral places together, to the extraordinary wonder of all that lodged near them; nay, the very *Cony-ſtealers* that were abroad that night, were ſo affrighted with the diſmal thundering, that for haſt they left their *Ferret* in the *Cony-boroughs* behind them, beyond *Roſamonds well*. Notwithſtanding all this, one of them had the boldneſs to ask in the Name of *God*, *what it was? what it would have?* and *what they had done, that they ſhould be diſturbed in this manner?* to which no *anſwer* was given, but the *noiſe* ceaſed for awhile. At length it came again, and (as all of them ſaid) brought ſeven *Devils* worſe than it ſelf. Whereupon one of them lighted a *candle* again, and ſet it between the two *chambers* in the door-way, on which another of them fixing his *eyes*, ſaw the ſimilitude of a *hoof* ſtriking the *candle* and *candle-ſtick* into the middle of the *bed-chamber*, and afterwards making three ſcrapes on the ſnuff to put it out. Upon this the ſame perſon was ſo bold as to draw his *ſword*, but he had ſcarce got it out, but there was another *inviſible hand* had hold of it too, and tug'd with *him* for it, and prevailing, ſtruck *him* ſo violently with the *pummel*, that *he* was ſtun'd with the blow.

44. Then began grievous noiſes again, in ſo much that they called to one another, got together and went into the *Preſence-chamber*, where they ſaid *Prayers* and ſang *Pſalms*; notwithſtanding all which, the thundring noiſe ſtill continued in other *rooms*. After this, *November* 3. they removed their *Lodgings* over the gate; and next day being *Sunday*, went to *Ewelm*, where how they eſcaped, the *Authors* of the *Relations* knew not;

but returning on *Monday*, the *Devil* (for that was the name they gave their nightly gueſt) left them not unviſited; nor on the *Tueſday* following, which was the laſt day they ſtaid. Where ends the *Hiſtory* (for ſo he was ſtiled by the people) of the juſt *devil* of *Woodſtock*; the *Commiſſioners* and all their *dependants* going quite away on *Wedneſday*; ſince which time, ſays the *Author* that lived on the place, there have honeſt *perſons* of good *Quality* lodged in the *Bed-chamber* and *with-drawing room*, that never were diſturb'd in the leaſt like the *Commiſſioners*.

45. Moſt part of theſe *Tranſactions*, during the ſtay of theſe *Commiſſioners*, 'tis true, might be eaſily performed by *combination*, but ſome there are of them ſcarce reconcilable to *Jugling*: Such as 1. The extraordinary *noiſes*, beyond the power of *man* to make, without ſuch *inſtruments* as were not there. 2. The taring down and ſpliting the *bed-poſts*, and puting out ſo many *candles* and ſo great *fires* no body knew how. 3. A viſible *ſhape* ſeen of a *horſes* hoof treading out the *candle*. And 4. a tugging with *one* of them for his *ſword* by an *inviſible hand*. All which being put together, perhaps may eaſily perſwade ſome *man* otherwiſe inclined, to believe, that *immaterial beings* might be concern'd in this buſineſs; which if it do, it abundantly will ſatisfie for the trouble of the *Relation*, ſtill provided the *ſpeculative Theiſt*, be not after all, a *practical Atheiſt*.

46. And thus, before I am aware, being fallen amongſt the *unuſual accidents* that have happened to *men only*, the next unaccountable thing that preſents it ſelf, is a remarkable *Dream* of *Thomas Wotton* Eſq; of *Boſton Malherb* in the County of *Kent*, Father to the famous Sir *Henry Wotton* Provoſt of *Eaton*, whoſe *dreams* did uſually prove true, both in fore-telling things to come, and diſcovering things paſt. The *dream*, 'tis true, of which I am now writing, was had at *Boſton* in *Kent*, but the moſt important concern of it relating to *Oxford*, I thought fit rather of the *two* to place it here; the particulars whereof, as taken *verbatim* out of Sir *Henry Wottons* life[b], are briefly theſe.

47, *This* Thomas Wotton, *a little before his death* dreamed, *that the* Univerſity Treaſury *was robbed by* Towns-men *and* poor Scholars, *and that the number was five. And being that day to write to his Son* Henry (*then a Scholar of* Queens College) *at* Oxford,

[b] *Inter Reliquias Wottonianas.*

he

he thought it worth ſo much pains, as by a Poſtſcript in his Letter, to make a ſlight enquiry of it. The Letter (which was writ out of Kent, *and dated three days before) came to his* Sons *hands the very morning after the night in which the robbery was committed; and when the* Univerſity *and* City *were both in a perplext inqueſt of the Thieves, then did Mr.* Wotton *ſhew his Fathers Letter, by which ſuch light was given of this work of darkneſs, that the five guilty perſons were preſently diſcovered, and apprehended.*

48. Amongſt the *unuſual accidents* attending men in their *Lives*, we muſt alſo reckon all *unuſual diſeaſes*, ſuch as that of Mr. *Evans* Rector of *Heath*, who had a *Ranula* under his *tongue*, wherein there bred a *ſtone*, I ſuppoſe *è ſanguine craſſo & terreſtri*; or as they call it, a *Tartareous* humor got together in the *veins* under the *tongue*, ſo hard and great that it almoſt quite deprived *him* of his ſpeech; which he drew away with his own hand, and as he told me ſent it to the *Medicin School* at *Oxford*; but upon ſearch I could not find it, nor had the *School-keeper* ever heard of any ſuch matter: So that whoever he were that he ſent it by, proved falſe both to *him* and the *Univerſity*; which I the rather note, that people hereafter may take more care by whom they ſend ſuch matters. Of juſt ſuch another *ſtone* as this Mr. *Liſter* gives us an account in a Letter to his *Grace* the *Arch-Biſhop* of *York*[c], cut from under the *tongue* of a *man*, and now preſerved in the Repoſitory of the *Royal Society*, which he chuſes to call *Lapis Atheromatis*, though the place of its birth made him allow the diſtemper to be a *Ranula*: but for my part, though the *Ranula* be always a *tumor*, and ſomtimes perhaps of that ſort they call *Atheromata*; yet the *place* giving the *diſeaſe* a peculiar name, I think I ought rather to call it *Lapis Ranulæ*, from the place of its birth, and thoſe only *Lapides Atheromatis* found in that *tumor* in other places of the body.

49. To this may be added a large *ſtone* taken out of the bladder of one *Skingley* of *Oxford*, weighing above a pound, and being ten inches round one way *ferè*, and full eleven the other; preſerved, and now to be ſeen in the *Medicin School*. As alſo a *Corn* that grew on the Toe of one *Sarney* a *Wheel-wright*, of St. *Aldates* Pariſh in the *City* of *Oxford*, *Anno* 1655. two inches long, which for the unuſual figure and bigneſs of it, I have cauſed to

[c] Philoſoph Tranſact. *Numb.* 83.

be ingraven of its juſt magnitude, *Tab.* 10. *Fig.* 16. which is alſo to be ſeen in the *Medicin School.*

50. Amongſt which alſo I think we may number the deſcending trunck of the *Arteria magna*, taken out of the body of an ancient *perſon*, by the ſkilful Mr. *Pointer* Chirurgion of *Oxford*, in the preſence of Dr. *Millington* our *Sidleyan Profeſſor* of *Natural Philoſophy*, whoſe innermoſt coat from above the *Emulgents* down to the *Iliac* branches, is by parcels only (and not continued throughout) turned into *bone*, the outer coat remaining ſoft and tender in its ordinary ſtate; which *Artery* remains to be ſeen in the cuſtody of Mr. *Pointer.* Juſt ſuch another *Artery* as this, I find obſerved by *Fallopius* [d]: and Dr. *Willis* took another of them out of a man much uſed to *wine* and *ſtale drinks* [e]; who alſo informs us, that in the *diſſection* of one that dyed of an ulcerated *Schirrus* in the *Meſentery*, he found one of the *Carotides* turned into *bone* in the ſame manner [f]: Beſide, above the *Emulgents* nearer the heart, there was a portion of this *Artery* turned into an *annulary bone*, perhaps ſuch another as was obſerved by Dr. *Harvey*, and *Veſlingius* [g], in the great *Artery* of an old man; but this I have not ſeen, it being in the poſſeſſion of our afore-mention'd *Profeſſor* reſiding in *London.*

54. Amongſt other the fore-runners of death and the grave; we muſt not forget extream *old age*, ſuch as thoſe above-mentioned, §. 3. of the *ſecond Chapter*; and of one *Joſias Pierce* late of *Witney*, better known by much by the name of *George Jüs*, who lived to the *age* of an hundred and twelve. Where alſo in the Tithing of *Curbridg* there is one *William Carter* now living, at leaſt a hundred years old, who yet it ſeems has not lived more abſtemiouſly than others of his rank, nor do's he now at this *age* take ſo much care, as other people of his health: he commonly lying naked amongſt the *blankets* of the *Mill* where he lives, which many times are not over dry; out of which he will go naked in the midſt of *winter*, and drink cold water at the *Rivers* ſide.

52. Of *accidents* in the very point of *death*, I have met with none obſervable amongſt the *Men* of this *County*, nor of any attending them in the *Grave*, except we may reckon that one, of *preſervation* from *corruption* many years after *death*; ſuch as that

[d] *Gabr. Fallop. Tom.* 2. *Tract.* 9. *cap.* 14. [e] *Pharmaceut. rationalis, ſect.* 6. *cap.* 3. [f] *Cerebr. Anatom. cap.* 7. [g] *Syntag. Anatom. cap.* 10.

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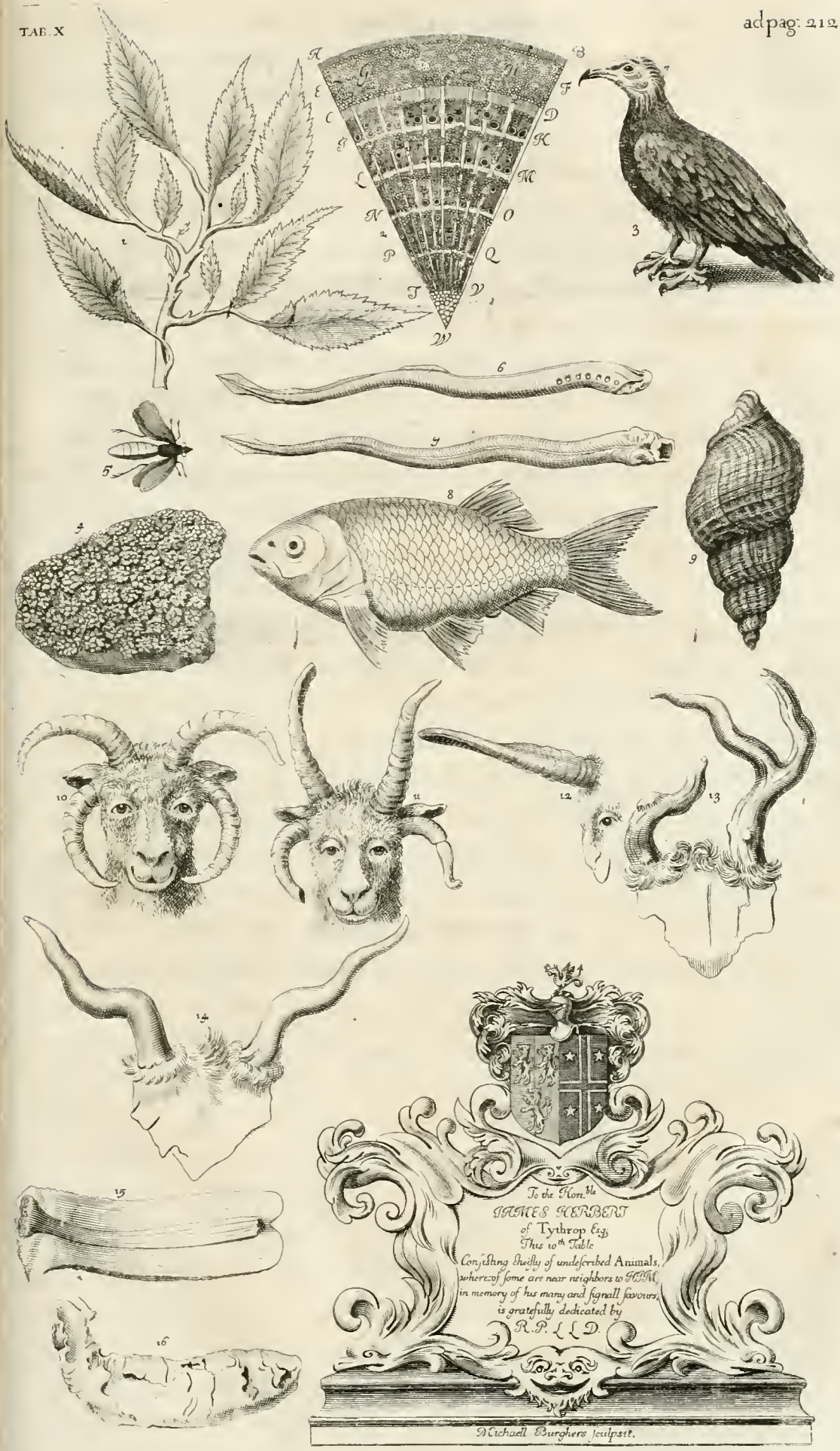


To the Hon.ble
JAMES HERBERT
of Tythrop Esq.
This 10th Table
Consisting chiefly of undescribed Animals,
whereof some are near neighbors to HIM,
in memory of his many and signall favours,
is gratefully dedicated by
R. P. L. L. D.

Michaell Burghers sculpsit.

of the body of *one* that had been *Rector* of *Wendlebury*, taken up in the *Church* there near forty years after he had been buryed, whose flesh yet look'd as *red* (as I was informed by the *Incumbent*, since also dead) as *raw beef*: which whether it might not be caused by the *petrifying* qualities of the *earths* and *waters* about that *Town*, would be an experiment worthy the trial of the *Ingenious* thereabout; or about *Sommerton* or *North Aston*, where it would be easie to try whether flesh were so inclinable to corrupt in *petrifying* waters as *others*. But if this prove the cause, all *bodies* must equally be preserved there, as well as that. *De quibus quære.*

53. And thus I had finish'd this *eighth Chapter*, but that I must beg leave to acquaint the *Reader*, that since the Printing the 21 §. of it, I have found the *Quintan* amongst the *Roman* exercises (which yet perhaps they might borrow from the *Greeks*) by the name of *Quintana*; so called, by reason the *Romans* in their *Tents* made first *four ways* in manner of a *Cross*, to which adding a *fifth* on one side, it was called *Quintana* *. In this way they set up a great *Post* about six foot high, suitable to the stature of a *man*, and this the *Roman* Soldiers were wont to assail, with all Instruments of *war*, as if it were indeed a real *enemy*; learning upon this, by the assistance of the *Campidoctores*, how to place their blows aright. And this they otherwise called *exercitium ad Palum*; and somtimes *Palaria*, the form whereof may be seen in *Vulturius* *: which practice being in use during their *Government* here, in all likelyhood has been retained among us ever since, being only translated in times of Peace, from a *military*, to a sportive *marriage* exercise.

* *Vid. Guid. Pancirollum, Rer. memorabilium, lib. 2. tit. 21.* * *In Augustanis Monumentis, p. 237.*

CHAP.

CHAP. IX.

Of Arts.

THUS having run through all the *Natural Bodies* I have met with in *Oxford-ſhire*, ſuch as either *Dame Nature* has always retained the ſame from the beginning, as *Waters*, *Earths*, *Stones*, *&c.* or freely produces in her ordinary courſe, as *Plants*, *Animals*, with all her *extravagancies* and *defects*, or other *accidents* attending: I am come at length, according to my propoſed *method*, to treat of *Arts*, and *things artificial*, that have either been *invented* or *improved* in this *County*; whereof firſt, of ſuch as have tended to the diſcovery of the *magnitudes*, or determination of the *motions* of the *Heavenly Bodies*, whither alſo muſt be referr'd the contrivance of new *Periods*, of new *Hypotheſes* and their *demonſtrations*. Secondly, I ſhall conſider *Air*, *Fire*, and *Water-works*, and thence go on to ſuch *Arts* as have any relation to *Earths*, *Stones*, or *Plants*. In ſhort, I ſhall here alſo follow the *method* of the whole *Eſſay* as in ſome other *Chapters*, by the way taking in all *Inventions*, and *improvements* that I have met with in this *County*, whether in the *Mechanick* or *Liberal* Arts; which I intend the whole *ſcope* of the following *Chapter*.

2. The firſt *Celeſtial Obſervations* in order of time, made here, that were any thing *artificial*, I preſume might be done by *Robert Groſthead* Biſhop of *Lincoln*, *craſſi quidem capitis, ſed ſubtilis ingenii*, ſays *Pitſeus* of him [h]; who amongſt other his Learned *works*, left us Treatiſes of the *Sphere* and the *Aſtrolabe*, with which no queſtion he found out many things that were *new* to that *age*: But becauſe we can inſtance in no *particulars*, let it ſuffice as an evidence of the great probability, that he is highly commended for his knowledge in *Aſtronomy* and *Perſpective* by *Roger Bacon* a *Frier minor* of *Oxon*: and ſomtime Fellow of *Merton College*, a Man of ſuch affrighting ſkill in *Mathematicks*, eſpecially *Perſpective*, that he juſtly deſerved the title of Dr. *Mirabilis*. Nor indeed was he out of the way who gave him ſo much, ſince had he

[h] *In Anno* 1253.

lived

lived in our days we could have given no leſs, to one who in all probability was a great *Improver* at leaſt, if not the *Inventor* of that uſeful *Mathematical Inſtrument*, ſince by *Galilæus* and others called the *Teleſcope*; of which admirable *Invention* perhaps *Oxford* may juſtly boaſt, and for it expect to be celebrated to all *poſterity*. Which aſſertion if made good with all perſpicuity and clearneſs, without wreſting any words or begging favorable conſtruction, I think I need not to doubt but on all hands 'twill be granted, that the *obſervations* here made as they were *new* and *frequent*, ſo to the *vulgar* and ignorant, they muſt needs be *terrible* and *amazing*.

3. That this Learned *Frier* underſtood all ſorts of *glaſſes*, and to order and adapt them to ſuch like purpoſes (not to cite other *places* that might eaſily be brought) I think I may with *truth* as well as *confidence* affirm from the unconſtrained ſenſe of his own words, in his Book of *Perſpective*. *Si vero corpora non ſunt plana per quæ viſus videt, ſed ſphærica; tunc eſt magna diverſitas, nam vel concavitas corporis eſt verſus oculum, vel convexitas* [i]. But, ſays he, if the *glaſſes* be not plain (having treated of them before) but *ſpherical*; the caſe is much otherwiſe, for either the *concavity* of the *glaſs* is next the *eye*, or the *convexity*, *&c.* Now that *he* uſed theſe *glaſſes* in *Celeſtial Obſervations*, is altogether as evident from the ſame *Book*, where *he* proceeds in theſe words. *De viſione fractâ, majora ſunt, nam de facili patet, maxima poſſe apparere minima, & è contra; & longe diſtantia videbuntur propinquiſſime, & è converſo: ſic etiam faceremus Solem, & Lunam, & Stellas deſcendere ſecundum apparentiam hic inferius, &c* [k]. Greater things are performed if the *viſion* be *refracted*, for [by *refraction*] 'tis eaſily made appear that the *greateſt things* may be repreſented *leſs*, and *little things* as the *greateſt*; and that things *a far off* may be repreſented *near*: Thus we can make the *Sun*, and *Moon*, and *Stars*, to all appearance, to come down to us here below, *&c.*

4. Again in his *Epiſtle ad Pariſienſem*, concerning the ſecret works of *Art* and *Nature*. *Poſſunt enim ſic figurari perſpicua, ut longiſſime poſita, appareant propinquiſſima, & è contrario; ita quod ex incredibili diſtantia legeremus literas minutiſſimas, & numeraremus res quantumcunque parvas, & ſtellas faceremus apparere quo vellemus* [l]. *Glaſſes* may be ſo figured, that things the moſt *remote* may appear

[i] *Perſpectiv. part.* 3. *diſt.* 2. *cap.* 3. [k] *Ibid. diſt. ultima.* [l] *In Epiſt. ad Pariſiens. cap.* 5.

near;

near; ſo that at an *incredible diſtance* we may read the ſmalleſt *Character*, and number *things* though never ſo *ſmall*; and laſtly, make *Stars* appear as *near* as we pleaſe. And *theſe things*, he ſays at another place, were to the *illiterate* ſo formidable and amazing, *ut animus mortalis ignorans veritatem non poſſit aliqualiter ſuſtinere* [m]: that no *mortal*, ignorant of the means, could poſſibly bear it.

5. Wherein this Learned *Franciſcan* did ſo far excel the ancient *Magicians*, that whereas they repreſented the *Moons* approach by their *magical charms*, he brought *her* lower with a greater innocence, and with his *glaſſes* did that in *truth*, which the ancient *Poets* always put in a *Fable*: thus *Petronius* brings in his *Witch*, boaſting the power of her *charms*.

—Lunæ deſcendit imago
Carminibus deducta meis.

And *Martial* [n] in the *Epitaph* of *Philænis* enquires,

Quæ nunc Theſſalico Lunam deducere Rhombo
Quæ ſciet?

All which put together, it muſt neceſſarily be confeſt, that *he* had ſome ſuch *Inſtrument*, though not ſo trimly made, 'tis like, as our *Teleſcopes* are now. In favor of which truth, much more might be alleged, did I not think this ſufficient to evince it with unprejudiced *Readers*, for whoſe benefit I have laid down his words thus at large, and tranſlated them (as I alſo intend in ſome other matters) that ſuch as have not the opportunity of ſeeing his *Books*, or underſtand not his *Language*, might give their verdict, as well as *thoſe* that have, or do.

6. Upon the account of theſe, and many other excellent *Experiments*, exceeding ('tis true) the *capacity*, but not the *malice* of thoſe times, he was accuſed of *Magick* in its worſt ſenſe, to have performed them by the concurrent help of the *Devil* [o], perſecuted as ſuch by thoſe of his own *Fraternity*, and thrown into Priſon by *Hieronymus de Eſculo* [p], *General* of his *Order*, afterward Pope by the name of *Nicholas the Fourth*, where they ſo barbarouſly treated him, that he was forced to ſeek redreſs of *Clement*

[m] *Perſpectiv. part.* 3. *diſt.* 3. [n] *Martial. Epigram. lib.* 9. *Epig.* 22. *ſive* 30. [o] *Vid. Hiſtor. & Antiq. Univerſ. Oxon. Lib.* 1. *p.* 138. [p] *Balæi Cent.* 4 *Numb.* 55.

the

the Fourth, to whom he made complaint not only of his hard uſage, and ſequeſtration of his *Books*, but charge of his *Experiments*, ſome whereof he tells him, eſpecially concerning *burning things* at any *diſtance*, would amount at leaſt to a *thouſand marks*, *Et certe combuſtio in omni diſtantia conſtaret pluſquam mille marcæ, antequam ſpecula ſufficientia fierent ad hoc*[q], are his very words. And at another place ſpeaking of *Mathematical Inſtruments*, *Inſtrumenta hæc non ſunt facta apud Latinos, nec fierent pro ducentis nec trecentis libris*[r], that they would not be made for two or three hundred pounds: great *ſums* indeed in *Bacons* time, yet ſcarce bearing proportion with his greater attempts.

7. Which made them at laſt ſo jealous of *him*, that notwithſtanding *he* wrote a whole Treatiſe againſt the uſe of *Magick*[s], they would ſuffer none to come near *him*, nor his *Books* to have place in their *Libraries*, inſomuch that it almoſt repented him of his Inventions[t], which in all probability (not to mention the *humor* of the *Age*, very careful of breaking the *Heavenly Seal* (as they called it) which obſcured their *myſteries* from the unworthy multitude) was the cauſe why he left us no particular *Phænomena* of the motions of the *Planets*, nor any thing of *new ſtars*; the diſcloſing ſuch *ſecrets* producing many inconveniencies. Which alſo was the reaſon (as gueſs'd by Dr. *Dee*[u]) why he never revealed his ſecret of *Gun-powder*; not but he eſteemed it a conſiderable *Invention*, but becauſe he fore-ſaw the many *evils* attending it, which theſe latter *ages* have ſeverely felt; ſince brought into practice by *Bertholdus Swartz*, of which more fully in its proper place.

8. So far then was *John Lipperſein* of *Zeland*, *Metius* of *Alckmar*, or *Galilæus* himſelf from being the *Inventor* of the *Teleſcope*, or firſt *applyer* of it to the *Heavens*; that perhaps had not *Bacon* left his Books to poſterity, with ſuch pregnant Indications how much might be done that way; *he* had been as little able to make thoſe *advancements* he did, as *Paulus Middleburgenſis*, or *Copernicus* had been, to give occaſion for the correction of the *Julian Calendar*, or *Tropical Year*, conſiſting of 365 days and 6 hours (firſt contrived, as *Bacon* informs us, by one *Fælix*[w], and only

[q] *In Operis Min. part.* 3. *cap.* 13. *MS. in Bib. Bod.* [r] *In eadem Op. Min. part.* 3. *cap* 11. [s] *Contra Necromanticos ſive de nullitate Magiæ.* [t] *Vid. Hiſt. & Antiq. Univerſ. Oxon. Lib.* 1. *p.* 138. [u] Dr. *Dee's* Annot. in Epiſt. *ad Pariſienſem.* [w] *In Libro Fratris Rog. Bacon.* Computus Naturalium, *dicto, cap.* 2 *MS. in Bibl. Coll. Univerſitatis Oxon.*

perfected by *Cæsar*) which though not performed till the time of *Gregory* the 13th, *Anno* 1582. yet the *first motion* of its being done, was certainly made by this Learned *Friar* to Pope *Clement* the 4th, as appears from a fair MS Copy of the fourth part of his *Opus minus* in the *Bodleyan Library*: Where after he has passionatly lamented its *errors* awhile, *he* gives this succinct account of it, *viz.* that its being greater than the true *Solar* year, was the cause of the going back of the *Æquinoxes* and *Solstices*, and then how all was to be amended.

9. *Quod autem hic intendo* (says he[x]) *est de correctione* Calendarii *quo utitur* Ecclesia. Julius *quidem* Cæsar *in* Astronomia *edoctus complevit ordinem* Calendarii *secundum quod potuit in tempore suo*; *& sicut* Historiæ *narrant contra* Achorium *Astronomum*, & Eudoxum *ejus Doctorem disputavit in* Egypto *de quantitate Anni* Solaris, *super quam fundatum est* Calendarium *nostrum, unde sicut* Lucanus *refert, ipse dixit*

Non meus Eudoxi vincetur fastibus Annus.

Sed non pervenit Julius *ad veram anni quantitatem quam posuit esse in* Calendario *nostro* 365 *dies, & quartam diei integram, quæ quarta colligitur per quatuor annos, ut in anno* Bissextili *computetur unius dies plus quam in aliis annis communibus: Manifestum autem est per omnes computistas, antiquos & novos, sed & certificatum est per vias* Astronomiæ, *quod quantitas anni* Solaris *non est tanta, imo minor*; *& istud minus æstimatur à sapientibus esse quasi* 130 *pars unius diei, unde tanquam in* 130 *annis superflue computatur unius dies, qui si auferretur, esset* Calendarium *correctum quoad hoc peccatum*, i. e.

10. That which I intend here (says he) is the correction of the *Calendar* now in use in the *Church*. *Julius Cæsar* indeed being learned in *Astronomy*, compleated the *Calendar* very well for his time, and as *Histories* tell us, disputed in *Egypt* against *Achorius*, and his Master *Eudoxus*, concerning the quantity of the *Solar* year, on which our *Calendar* is founded, which made *Lucan* bring him in speaking to this effect,

The Julian, *shall ne'r be prov'd amiss,*
By the Eudoxian *Ephemeris.*

But *Julius* never came to the knowledge of the true quantity of

[x] 4° *MS. in Bib. Bod. in Musæo Protobibliothecarii p.* 327.

the

the *year*, which he made to consist of 365 days, and a whole *fourth* part of a day. which *fourth* part collected at four years end, made, that in the *Bissextil* there was one day more than in any other *year*: But 'tis manifest (says he) to all *Astronomers* both old and new, and 'tis plain from the rules of *Astronomy*, that the quantity of the *Solar* year is not so much, but less, and that as 'tis judged by wise men, by the 130th part of a day; whence it comes to pass, that in 130 years we have one superfluous day, which were it but taken away, the *Calendar* would be corrected as to this error.

11. And then he proceeds to shew, that upon this account it is that the *Æquinoxes* and *Solstices* are not fixt, but continually ascend in the *Calendar*, that in the beginning of the *Church* they were not, where they are now in his time; and in the conclusion of the Discourse, *Debet autem nunc temporis remedium apponi propter istos errores manifestos, &c*[y]. But that now some remedy must be found for those palpable errors, and that to take off scandal from the *Church*; for (says he) all the learned in *Astronomy* know this, and laugh at the ignorance of the *Prelates* that suffer it. Nay, the Infidel *Arabians*, *Hebrews*, and *Greeks*, abhor the folly they see in the *Christians* in ordering the time they set aside for their greater *Solemnities*: But now *Christians* have so much skill in *Astronomy*, that they can amend all these things. Therefore your *Holyness* (meaning *Pope Clement*) may command, *& invenietis homines qui præclara remedia apponent in hac parte.*

12. Thus earnestly wrote he for the reformation of the *Calendar*, not only in this but in several other Books; in one whereof he makes also this complaint, *Non tamen aliquis præsumit tradere* Calendarium *correctum*, *propter hoc quod* Concilium *generale prohibet ne quis mutet* Calendarium, *sine licentia sedis* Apostolicæ *generali*[z], *i. e.* Yet no body presumes to correct this *Calendar*, because it is forbid by a *General Council* that no man should offer to alter it, without special license first obtained of the *Apostolick Sea*. Which license I gather at length was given *him*, for I find *him* in the end of the aforesaid *Chapter*, mentioning a more correct *Copy* of a *Calendar* sent to the aforesaid *Pope* by his Boy *John*, than any *he* had sent *him* before. *Cum propter festinantiam, & propter*

[y] *Loco citato sub finem Paragraphi.* [z] *In Operis Minor. part.* 3. 4°. *MS. in Bibliotheca Bodleiana cap.* 67.

occupationes in aliis magnas & varias, veſtrum Exemplar non fuit uſquequaque correctum, hic iterum feci tranſcribi, & correxi; & hæc ideo facio, ut certitudinaliter conſiderare & conferre poſſitis de hâc materia cum quocunque velitis, i. e. becauſe upon the account of haſt and various other buſineſſes intervening, your *Copy* was not ſufficiently correct, I have corrected and tranſcribed it again, that you might conſider and confer about it more certainly with whom you pleaſe. A perfect and fair MS. *Copy* of which *Calendar*, I hear yet remains in the hands of one Mr. *Theyer*, a Gentleman of *Glocester-ſhire*.

13. From which, or ſome other *Calendar* of his, *Paulus Middleburgenſis* Biſhop of *Foſſombrone*, in the *Dukedom* of *Urbin*, ſtole half of his great Volum, which he calls his *Paulina*, concerning the true time of keeping *Eaſter*, and day of the Paſſion of our Lord JESUS; directed to Pope *Leo the Tenth*, in order to the reformation of the *Roman Calendar* and *Eccleſiaſtical Cycles*, written juſt in the ſame order and method generally and particularly as *Roger Bacon* long before had done to *Clement the Fourth*; and yet full ſlender mention (ſays Dr. *Dee* [a]) doth this *Biſhop* make of *him*, though his chief Inſtructor in the beſt part of the matter contained in his *Book*: In which deſign, though the *Plagiary* were unſucceſsful, his endeavors being fruſtrated for a time, yet 'twas he that ſtirred up *Nicholas Copernicus* (as the ſame *Nicholas* honeſtly confeſſes in an *Epiſtle* of his to *Paul the Third* [b]) more accuratly to obſerve the motions of the *Sun* and *Moon*, and thence to define the quantities of years and months more truly than they were before in the *Julian Calendar*; upon whoſe foundations *Aloyſius*, and the reſt of the ſumptuous *College* of *Mathematicians* at *Rome* having built their *Reformation*, it is eaſily deducible that whatever has been done in this matter from the time of *Frier Bacon*, to that of Pope *Gregory the Thirteenth*, muſt in great meaſure be aſcribed to *him*, their whole *Reformation* ſcarce differing from *his*.

14. Only in this (which is well worth the obſervation) that whereas the *Gregorian Reformers* reduced the *Equinoxes* and *Solſtices* to the places they ſuppoſed they held in the time of the *Nicene Council*, *Bacon* ſeems inclinable to have brought them (and

[a] Dr. *Dees* propoſal to Queen *Elizab.* and her *Council* concerning the reformation of the vulgar *Calendar. MS. in Biblioth. C. C. C. Oxon. lit. Z fol.* [b] *In Præfat. in libros revolutionum.*

that

that moſt rationally) to their places, in a much more eminent *Epoche*, *viz.* the *Winter Solſtice* to the tenth of the *Calends* of *January*, and the *Vernal Æquinox* to the tenth of the *Calends* of *April*, their true places at the time of Chriſts birth: which he proves by a very cogent Argument drawn from the obſervations of *Ptolomy*, who lived but 140 years after Chriſt; in whoſe time the *Vernal Æquinox* was found to be on the eleventh of the *Calends* of *April*: now allowing, as before, that it aſcends in the *Calendar* a whole natural day in 130 years; if in *Ptolomies* time it fell on the eleventh of the *Calends* of *April*, it muſt needs at Chriſts birth have been at leaſt on the tenth; and ſo of the *Solſtice* *. According to which computation they have now gon back in our *Calendar* ſince Chriſts time almoſt 13 days, the number 130 days being ſo often to be found in 1676. wanting but 14. Now the *Æra* of Chriſts birth being a time of much higher value, and more to be reſpected by Chriſtians than the *Nicene Council*, in what ever elſe they have exceeded him, I am ſure in this they have fallen ſhort of his *reformation*.

15. And ſo much for the invention of the *Teleſcope*, and other *Inſtruments*, by the aſſiſtance whereof he ſo nearly defined the true quantities of the *Solar* and *Lunar years*, that he firſt gave occaſion to the reformation of the *Julian Calendar*: wherein if the *Reader* (with me) be convinced, let *him* hither refer thoſe inordinate *Encomiums* by *Kepler*, *Fabricius*, and *Cæſar la Galla*, heaped on *Galilæus* for the one; and whatever elſe of that nature he ſhall meet with, given to *Paulus Middleburgenſis*, *Copernicus*, or *Aloyſius* for the other.

16. Thus was the Chriſtian World firſt informed in matters of *Aſtronomy* by *Roger Bacon*, and with ſo much ſucceſs here in *England*, that in the next *Century* we meet with *Richard Wallingford* Abbot of St. *Albans*, and *Simon Bredon*, both *Oxford* men, the moſt eminent for their time in the whole World: who for their ſubtilty, and yet clearneſs of demonſtration, we find yoaked with no leſs than the great *Albategnius*, by *Lewis Caerlyon* alſo an *Oxford* man, in his obſervations of the *Eclypſes*, *An. Dom.* 1482 [c]. where alſo he treats of the *oblique aſcenſions* of the *Signs* calculated to the *Meridian* of *Oxford*. And quickly after we meet with

* *In Operis Min. part.* 3. *cap.* 69. *MS. in Bibliotheca Coll. Univerſ.* [c] 4° *MS* 79. *inter Codices MS. Seldeni.*

William

William Rede (after *Biſhop* of *Chicheſter*) and *John Eſchenden* jointly to carry on this ſtudy, as appears from their Treatiſes of the *central Eclyps* of the *Moon*, and conjunction of the three ſuperior *Planets* that happen'd *An.* 1345. and the great conjunction of *Jupiter* and *Saturn*, *An.* 1365. both which were calculated by *William Rede*, and the *Prognoſtications* added by *John Eſchenden* [d]: From which *Eclyps*, and the firſt *conjunction*, he fore-told the *Epidemical Peſtilence* that followed in the year 1349. which beginning in *Turky*, ſpread all over *Syria* and *Greece*; whence it came into *Italy*, *Spain* and *France*, and at length into *England*. To theſe add *John Somer* and *William Wyrceſter*, alſo moſt eminent *Aſtronomers*; the former whereof corrected the *Calendar* perhaps yet more accuratly than *Bacon* [e]; and the latter wrote a verification of all the *fix'd ſtars*, as to their *longitude* and *latitude*, for the year 1440 [f]. with ſome other *Aſtronomical* matters, at the inſtance of his Patron Sir *John Falſtoff*.

17. Great we ſee was the increaſe of this ſort of *Learning*, even in thoſe days, yet that former Ages may not carry away the whole honor, let us alſo make an eſtimate of its *modern advancements*; ſuch as it received from *Thomas Lydiat*, formerly Fellow of *New College*, and Rector of *Alkerton* in this County, who defining a yet truer *period* than any of the *former*, of the *Sun* and *Moons* motion (without which, there could be no accurat *Syſtem* or *Calendar* of *years*, *months* and *days*) moſt happily firſt contrived the *Octodeſexcentenary Period*: *ipſe primus*, *abſit dicto invidia*; *noſtro ſeculo obſervavi*, are his own words [g]: Which *Period*, though till now not ſo certainly known, by Learned Antiquity was called the *great year*, as is manifeſt from *Joſephus* his Hiſtory of the *Jews* [h], where ſpeaking of the great advantages our *Forefathers* had in *Aſtronomy*, he ſays, Πλέον ζῆν ἢ Θεὸν αὐτοῖς ἐδωκεῖν, ἅπερ οὐκ ἦν ἀσφαλῶς αὐτοῖς προειπεῖν, μὴ ζήσασιν ἐξακοσίους ἐνιαυτούς, ἐπεὶ τοσοῦτον γὰρ ὁ μέγας ἐνιαυτὸς πληροῦται. *i.e.* that 'tis probable *God* gave them a longer life, that they might fully underſtand the *Theorems* of *Aſtronomy*, which they could not well do, unleſs they lived ſix hundred *years*; for the *great year*, ſays he, is accompliſh'd in that number of *years*.

18. Which *Lydiat* found to come ſo near the truth, that there

[d] *Fol. MS.* 176. *inter Codices Digby.* [e] *Quod. vid. inter Codices Digby*, 12° *MS.* 5. [f] *MS. inter Codices Laud*, 12°. B. 23. [g] *Lydiati Ep. Aſtronom. de Anni Solaris menſura.* [h] *Lib.* 1. *cap.* 4. *ſub. finem.*

needed

needed but the abatement of eight in six hundred, his true *period* consisting of 592 years, and that (according to *Geminus*) of whole *years*, whole *months*, and whole *days*, as a *period* ought to do [i], *viz.* of 592 intire *solar years*, 7322 entire *months* (whereof 218 are *intercalary*) 216223 entire *days*, and 30889 entire *weeks*; defining every *Lunar month* to consist of 29 days, 12^{h}, 44′, 3″, 12‴, 44⁗, 3ᵛ, 12ᵛⁱ. And the *solar year* of 365 *days*, 5^{h}, 47′, 50″, 16‴, & $\frac{8}{37}$; or 5^{h} and $\frac{59}{74}$; or 365 *days* and $\frac{1}{128}$ part of a *day*: So that the whole *period*, or 592 *Lydiatean years*, do anticipate so many *Julian* ones by five *days*.

19. According to this *period* found out in *An.* 1605. exceeding the *Dionysian* but 60 *years*, he calculated the middle motions of the *seven Planets* for the *nine* first *periods* entirely, and the *tenth* so far forth as it had gon in his time; (some MS. fragments of which *calculations* I had lately in my possession, but now disposed of to the Worshipful Dr. *Lanphire*, Principal of *Hart-hall*, carefully to be preserved amongst the rest of his writings.) And in *An.* 1620. *viz.* in the last year of the first half of his *tenth period*, he put it forth, with his *Menologium*, or reformation of the *Calendar*, which he opposed to the *new*, but confused, absurd, and false *Pontifical Gregorian year*, contrived by the sumptuous *College* of *Mathematicians* at *Rome*; and defended it against the obtractations of *Joseph Scaliger* [k], a man, 'tis true, of great Learning, but withal so confident and imperious, so abusive and assuming, that whenever he wanted Arguments for the support of his cause, he always sought revenge upon the person of his *Adversary*.

20. Which was manifestly the case of modest *Lydiat*, whom in an *Epistle* to *Richard Thomson* (his correspondent in *England*) he calls, *the greatest monster that ever* England *produced* [l]; and in another to the same *Thomson*, *the veryest fool in the whole world*, and that 'twas *below his dignity*, *nor had he leisure to write against such a Beetle* [m]. But herein (as the Reverend Dr. *Heylin* very well notes in another case) we must pardon *Joseph*; *for had not scorn and contempt been part of his Essence*, *he had neither been a* Scaliger, *nor the son of* Julius [n], who scrupled not to pass this rash censure on the whole *English* Nation; that we are, *Perfidi*, *inflati*, *feri*, *con-*

[i] *Periodus debet comprehendere ὅλας ἡμέρας, καὶ ὅλας μῆνας, καὶ ὅλας ἑαυτὰς. Geminus in libro Φαινομένων.* [k] *Vid. Lydiati Solis & Lunæ periodum, in Titulo.* [l] *Joſ. Scaligeri Epiſtolar. lib.* 3. *Epiſt.* 240. [m] *Joſ. Scaliger. Epiſtol. lib.* 3. *Epiſt.* 241. [n] *Cosmograph. in Cald. Assyr. & Mesopot. sub finem.*

temptores,

temptores, ſtolidi, amentes, inertes, inhoſpitales, immanes [o]. In which very act yet I think he proves nothing, but that moſt of thoſe *Epithets* rather belong to *himſelf.*

21. If it be objected that *Joſeph* did not ſo far *patrizare*, but that he ſpake Honorably of ſome of the *Engliſh*, ſuch as *Wotton*, *Savil*, *Camden* [p], *Reynolds* [q]: it muſt be anſwered, That theſe touched not the *apple* of his *eye*, nor endeavored the ruin of his great *Diana*, the *Julian Period*, of which he conceited himſelf the *Inventor*: which yet ſince by an indifferent, and that a competent *judge*, is given to *Robert Lorringe* an *Engliſh* Biſhop of *Hereford*, who lived 500 years before *Scaligers* invention [r]. 'Tis true, he fitted it to *Chronological* uſes; but whil'ſt in the midſt of his glorious attempts, behold him ſhaken by meek, and modeſt *Lydiat*, the happy *Inventor* of a more accurat *period*, whereby he ſo diſturbed and confounded all his *ſupputations*, that (if we may believe the moſt Learned of the Age) he laid his *angry Rival* flat upon his back.

22. And ſo much concerning the *Lydiatean Period*, of which, becauſe ſo much already in Print, I ſhall not add more, only in what *years* of as many of *them*, as have already been (which poſſibly may not be unacceptable to the *Reader*) the moſt conſiderable *Æra's* of the world have happen'd.

	Years of the World.	*Years of the* Lydiatean *Periods.*	
The Flood.	1657.	473.	(3)
Birth of Iſaac.	2109.	333.	(4)
Exodus.	2509.	141.	(5)
The Temple.	2988.	28.	(6)
Empire of Nebuchadn.	3401.	441.	(6)
Empire of Cyrus.	3471.	511.	(6)
Empire of Alexander the Great.	3675.	123.	(7)
Empire of Jul. Cæſar.	3956.	404.	(7)
Baptiſm of Chriſt.	4033.	481.	(7)
The Dionyſian *year of our Lord*, 1620.	5624.	296.	(10)
The year of our Lord, 1676.	5680.	352.	(10)

[o] *Jul. Cæſar Scal. Poetices, lib. 3. cap. 16.* [p] *Joſ. Scalig. Epiſtol. lib. 3. Epiſt. 232.* [q] *Ibid. lib. 4. Epiſt. 446.* [r] *In Præfat. in Annales Jac. Uſſerii, Archiep. Armachan.*

23. If

23. If I descend yet lower to *persons* now living, we shall daily find *Astronomy* receiving new *advancements*, particularly from the Right Reverend Father in God, *Seth* Lord Bishop of *Sarum*, one of the most cordial *Promoters* of this undertaking: who rather embracing the opinions of *Diogenes*, *Apollonius Myndius*, of the *Chaldees*, and at length of *Seneca*; That *Comets are perpetual Stars, and carryed about in a continued motion*; than of *Kepler*, who thought them still produced *de Novo*, quickly perishing again; or of *Gassendus*, who held indeed they might be *corpora æterna*, but yet that they always moved in *straight lines*; he first proposed this new *Theory* of them, *viz.* that it was much more probable they might rather be carryed round in *Circles* or *Ellipses* (either including or excluding the *Globe* of the *earth*) so great, that the *Comets* are never visible to us, but when they come to the *Perige*'s of those *Circles* or *Ellipses*, and ever after invisible till they have absolved their *periods* in those vast *Orbs*, which by reason of their standing in an oblique, or perpendicular posture to the *eye*, he demonstrated might well seem to carry them in *straight lines*; all *circles* or *ellipses* so posited, projecting themselves naturally into such *lines*: which *Theory* was first proposed in a *Lecture* here at *Oxford*, and afterward set forth in the year 1653. The Right Reverend Father in God, *Seth* Lord Bishop of *Sarum*, and my very good *Lord*, being then *Professor* of *Astronomy* in this *University*.

24. In the same year, the same Right Reverend, and most accomplish'd *Bishop* first *Geometrically* demonstrated, the *Copernico-Elliptical Hypothesis* to be the most *genuine*, *simple* and *uniform*, the most easie and *intelligible*, answering all *Phænomena* without complication of motions, by *Excentrics*, *Epicycles*, or *Epicyc-Epicycles*. That the *Excentricities* of the *Planets* and their *Apoge*'s according to the *Ptolomaic hypothesis*, and the *Aphelions* according to the *Copernican*, might all be solved by a simple *Elliptical* line, was first indeed noted by *Kepler*, but how their *proper* and *primary Inequalities*, or *Anomaliæ Coæquatæ*, should thence be demonstrated *geometrically*, he profest he knew not, and utterly despaired it would ever be done: which stirred up the Learned *Ismael Bullialdus* to attempt the removal of this disgrace to *Astronomy*, which accordingly he thought he had done, finding the *method* of the *Aphelions*, and demonstrating (at least as he thought) the first *Inequa-*

lities geometrically, and making *Tables*; calling his work *Astronomiam Philolaicam.*

25. But how far he came short of what he pretended, was so plainly and modestly made appear by the Reverend *Bishop*, in a Book which he entituled, *Inquisitio in* Ismaelis Bullialdi *Astronomiæ Philolaicæ fundamenta. Edit.* Oxonii, 1653. that the ingenious *Bullialdus* himself, sent him a *Letter* of thanks, and recognition of his *errors*. Where also he further shews, that although *Bullialdus* had not, and *Kepler* thought no man could, rightly *calculate* the first *inequalities* according to the rules of *Geometry*, *i. e.* out of the known *middle motions* of the *Planets* (or true places of the *Aphelions*) accuratly find *a priori*, their true or *appearing motions*: That yet there were *methods* by which it might be done, whereof he propounded *two* in the same *Book*, and demonstrated them, which afterwards applying to all the *primary Planets*, he set forth both *Elliptical* and *Circular Astronomy*, shewing how the *Phænomena*, according to both *Hypotheses*, might be *geometrically* made out, which he called his *Astronomia Geometrica.* Edit. Londini, An. 1656.

26. The *Elliptical Hypothesis* has received yet further advancement from Mr. *Edmund Hally* of *Queens College Oxon.* a young man, for his years of prodigious skill in *Astronomical* matters, who, amongst many other excellent performances in that *Science* to be met with in our *English Philosophical Transactions* [s], has shewed us a direct and *geometrical method* for finding the *Aphelions*, *Excentricities*, and *proportions* of the *Orbs* of the *primary Planets*, without supposing the *equality* of the *angle* of *motion* at the other *Focus* of the *Planets Ellipsis*, which has been hitherto always done amongst *Astronomers* [t]: From whom I dare promise yet further *improvements*, he being lately gon to the *Isle* of St. *Helen*, for the more advantagious prosecution of his *Astronomical* studies; from whose *solitary observations* there, and *comparative ones* with Mr. *Flamsted*'s here, *Astronomy* no question will receive considerable *advancements.*

27. To which may be added several other *improvements* this *Science* has received from that incomparable person Sir *Christopher Wren*, late *Professor* here: who before any thing of *Hugenius* appeared on that *subject*, from his constant *observations* of *Saturn*,

[s] Philosoph. Transactions, *Numb.* 116, 127, 128. [t] *Ibidem. Numb.* 128.

stated

ſtated a *Theory* of that *Planet*; and of the *Moons Libration*. He has attempted alſo (and perhaps by this time performed) a *Selenography* by meaſure, what we have yet of that kind being rather *pictures*, than accurate *ſurveys* or *maps* of the *Moon*: To this purpoſe he contrived a *Lunar globe*, repreſenting not only the *Mountains* and *Valleys* in ſolid work, but the ſeveral degrees of *whiteneſs* and *blackneſs* on the ſurface, which if turned to the light, ſhews all the *menſtrual phaſes* of the *Moon*, with the ſeveral appearances that ariſe from the *ſhadows* of the *Hills* and *Vales*.

28. He has made *Maps* of the *Pleiades*, and other *Teleſcopial ſtars*, and propoſed ways to ſolve the great *Queſtion* concerning the *earths* reſt or motion by ſome ſmall *ſtars* about the *North pole*, to be ſeen only in large and well made *Teleſcopes*: To which *Inſtrument* he has added many ſorts of *Rete*'s, *ſcrews*, and *Apertures*, to take in more or leſs *light*, by opening and ſhutting like the *pupil* of the *eye*, according as the *Obſerver* thinks fit; and has improved the *manufacture* of grinding good *glaſſes*. He has alſo made two *Teleſcopes* to open with a *joynt* after the manner of a *ſector*, whereby *diſtances* may be taken to *half minutes*, and no differences found in the ſame *obſervation* often repeated, the *Inſtrument* not being lyable to any prejudice by warping or luxation. He has contrived and hung *Quadrants*, *Sextants*, and *Radii*, much better than heretofore, by which *Aſtronomical Obſervations* may be made more accurate and eaſie. Of all which ingenious and uſeful *Inventions*, there are much more full and *elegant relations*, in the moſt accurate *Hiſtory* of the *Royal Society*[u]: However, they being moſt, if not all of them found out *here*, or at leaſt whil'ſt their *Author* was *Aſtronomy Profeſſor* in this *Univerſity*, I could not but mention them with relation to this place, as I ſhall ſome other matters which ow their *invention* to the ſame *worthy perſon*.

29. And theſe are all the *modern advancements* in *Aſtronomical* matters I can at preſent think of, onely a late *invention* of one *R. Holland*, a teacher of *Mathematicks* in this *City* for many years, who has ſhewed us a way to get the *Angle* of *Parallax* of a *Comet* or other *Phænomenon* at two *obſervatious* to be taken in any one ſtation or place of the *earth*, and thereby the diſtance from the *earth*: whereof no more, there being a ſhort account of the whole *contrivance* ſet forth by *himſelf*, and printed at *Oxford*.

[u] Hiſtory of the Royal Society, *Part.* 2. *ſub finem.*

30. Having done with the *Inventions* and *Improvements* that concern the *Heavens*, come we next to thoſe belonging to the *ſublunary World*, whereof the ſame Ingenious Sir *Chriſtopher Wren* has furniſh'd us with ſeveral; as of exquiſite ſubtilty, ſo of excellent uſe: Such as his contrivance to make *Diaries* of *wind* and *weather*, and of the various qualifications of the *air*, as to *heats*, *colds*, *drought*, *moiſture*, and *weight*, through the whole *year*; and this in order to the *Hiſtory of Seaſons*: with obſervation, which are the moſt healthful or contagious to *men* or *beaſts*; which, the Harbingers of *blights*, *meldews*, *ſmut*, or any other accidents attending *men*, *cattle*, or *grain*; ſo that at length being inſtructed in the *cauſes* of theſe *evils*, we may the eaſier *prevent*, or find *remedies* for them.

31. Now that a conſtant obſervation of theſe qualities of the *air*, both by night and day might not be inſuperable; he contrived a *Thermometer* to be its own *Regiſter*, and a *Clock* to be annexed to a *weather-cock*, which moves a *Rundle* covered with white Paper; upon which the *Clock* moving a black-lead *penſil*, the *obſerver*, by the traces of the *penſil* on the paper, may certainly know what *winds* have blown, during his ſleep or abſence, for 12 hours together. He has alſo diſcover'd many ſubtile ways for eaſier finding the degrees of *drought*, and *moiſture*, and the gravity of the *Atmoſphere*; and amongſt other Inſtruments, has *Ballances* (alſo uſeful for other purpoſes) that ſhew the preſſure of the *air*, by their eaſie (I had almoſt ſaid ſpontaneous) inclinations [w].

32. He has made Inſtruments whereby he has ſhewn the Mechanical reaſon of *ſailing* to all *winds*; and others of *Reſpiration*, for ſtraining the *breath* from thick vapors, in order to tryal whether the ſame *breath* thus purified will ſerve turn again. Which *Experiments*, however nice they may ſeem, yet being concerned about a ſubject ſo nearly related to *man*, that he always lives in it, and cannot long without it, and is well or ill according to its alterations, the minuteſt diſcoveries of its *nature* or *qualifications* ought to be valuable to us.

33. Wherein yet we have been aſſiſted by nothing more, than the *Pneumatick Engine*, invented here at *Oxon*: by that miracle of Ingenuity, the Honorable *Robert Boyle* Eſq; with the concurrent

[w] *Ibidem.*

help

help of that exquiſite contriver, Mr. *Robert Hook*, commonly called the *Air Pump*; ſo different a thing from the *Inſtrumentum Magdeburgicum*, deviſed by *Otto Gericke*[x], an ingenious *Conſul* of that *Republick*, that it can ſcarce be reckoned an improvement of *that*, but a new *Engine*; although it muſt not be denyed but the *Magdeburg Experiment* gave occaſion to its *Invention*. By the aſſiſtance whereof, that *Noble Philoſopher* hath accuratly examined the *Elaſtical power*, *preſſure*, and *weight*; *expanſion* and *weakneſs* thereupon, of this *element*; and thereby found out ſo many things *new*, relating to the height and gravity of the *Atmoſphere*, nature of a *Vacuum*; *Flame*, and *Excandeſcence* of *coals*, *match*, firing of *gun-powder*; propagation of *ſounds*, *fluidity*, *light*, *freezing*, *reſpiration*, *&c.* that to give an account of them all according to the merits of the *Experiments*, would be to tranſcribe the whole *Treatiſe* of that *Honorable Author* ſet forth on this ſubject; whither I refer the *Reader* for further ſatisfaction, and ſo to the reſt of his *Works* upon ſeveral other ſubjects; many of his numerous *inventions* and *improvements*, wherewith he has ſo highly obliged the World, having been made in this place.

34. Whereof I ſhall mention no more (it being indeed uncertain as to moſt of them, which were made here, which at *London*, and which at other *places*) only the *Barometer*, a well known Inſtrument, alſo invented here by the ſame *Noble Perſon*, whereby, the gravity of the *Atmoſphere* has been daily obſerved by the Reverend and Learned Dr. *John Wallis*, for about ſix years together: in all which time he found the *Quick-ſilver* in the *Tube*, never to aſcend much above 30 inches, and never to deſcend much below 28, which he takes to be the whole *latitude* of its *variation*. He alſo obſerved, for moſt of that time, the temper of the *air* by a *Thermometer*, whereof he has ſtill the Notes by him, which are very particular for every day.

35. Which latter *inſtrument*, though of very ancient *invention*, there having been one of them found by *Robert de Fluctibus* graphically delineated, in a MS. of 500 years antiquity at leaſt[y]: yet it has ſtill received other uſeful *advancements* (beſide that above mention'd) from that curious Artiſt Sir *Chriſtopher Wren*, who finding the uſual *Thermometers* not to give ſo exact a meaſure of the *airs* extenſion, by reaſon the gravity of the *liquor* as it

[x] *Gaſp. Schotti Magiæ Univer. part.* 3. *lib.* 7. *cap.* 6. [y] Moſaical Philoſophy; *lib.* 1. *cap.* 2.

ſtands

ſtands higher or lower in the Glaſs, weighs unequally on the *air*, and gives it a contraction and extenſion, beſide what is produced by *heat* and *cold*; he therefore invented a *Circular Thermometer*, in which the *liquor* can occaſion no ſuch fallacy, it remaining continually of one *height*, and moving the whole *inſtrument* like a wheel on its axel [z].

36. Amongſt other *Aerotechnicks*, here is a Clock lately contrived by the ingenious *John Jones* LL. B. and Fellow of *Jeſus College Oxon*: which moves by the *air*, equally expreſſed out of *bellows* of a *cylindrical* form, falling into folds in its deſcent, much after the manner of Paper *Lanterns*: Theſe, in place of drawing up the weights of other *Clocks*, are only filled with *air*, admitted into them at a large orifice at the top, which is ſtop'd up again as ſoon as they are full with a hollow *ſcrew*, in the head whereof there is ſet a ſmall *braſs plate*, about the bigneſs of a ſilver half penny, with a hole perforated ſcarce ſo big as the ſmalleſt pins head: through this little hole the *air* is equally expreſſed by *weights* laid on the top of the *bellows*, which deſcending very ſlowly, draw a *Clock-line*, having a counterpoiſe at the other end, that turns a pully-wheel, faſtened to the *arbor* or *axis* of the *hand* that points to the *hour*: which device, though not brought to the intended perfection of the Inventor, that perhaps it may be by the help of a *tumbrel* or *fuſie*, yet highly deſerves mentioning, there being nothing of this nature that I can find amongſt the writers of *Mechanicks*.

37. To which may be added, a hopeful *improvement* of that uncommon *Hygroſcope*, made of two *Deal*, or rather *Poplar boards*, mention'd in our Engliſh *Philoſophical Tranſactions* [a], contrived by my ingenious Friend *John Young* M. A. of *Magdalen Hall*, who rationally concluding, that the *teeth* of the thin piece of *braſs* placed acroſs the juncture of the two *boards*, muſt needs in its paſſage from bearing on one ſide of the *teeth* of the *pinion*, to the other, upon change of weather, make a ſtand as it were in reſpect of the motion of the *axel* of the *hand*; thinks a pretty ſtiff *ſpring* cut on the under ſide, after the manner of a fine *file*, placed flat and not edge-ways, and bearing pretty hard upon an *axel* of *Copper*, may turn the hand upon change of *weather* in the *punctum* of reverſion, without any more than a negative reſt: which be-

[z] Hiſtory of the Royal Society, *part.* 2. *ſub finem.* [a] Philoſoph. Tranſact. *Numb.* 127.

ing

ing an opinion ſo very rational and unlikely to fail, when brought to the teſt, I thought fit to propound it to the *Ingenious*, though the *Preſs* would not give us leave firſt to experiment it our ſelves. Whence I proceed,

38. To ſuch *Arts* as relate to the *Fire*, which I have placed next, in regard we have knowledge of no other but what is *Culinary*; that in the *concave* of the *Moon* being only a *dream* of the *Ancients*. Amongſt which, we muſt not forget the perpetual, at leaſt long-lived *Lamps*, invented by the Right Worſhipful Sir *Chriſtopher Wren*; nor his *Regiſters* of *Chymical Furnaces* for keeping a conſtant heat in order to divers uſes; ſuch as imitation of Nature in the production of *Foſſiles*, *Plants*, *Inſects*; *hatching* of *Eggs*, keeping the motions of *Watches* equal, in reference to *Longitudes* and *Aſtronomical* uſes, and ſeveral other advantages [b].

39. But amongſt all the *Fire-works* ever yet produced by the Art of Man, there is none ſo wonderful as that of *Frier Bacon*, mention'd in his Epiſtle *ad Pariſienſem*, where ſpeaking of the ſecret works of *Nature* and *Arts*, he has theſe words, *In omnem diſtantiam quam volumus* poſſumus *artificialiter, componere ignem, comburentem ex ſale Petræ, & aliis* [c]; which *alia*, as the Reverend and Learned Dr. *John Wallis* ſaw it in a MS. Copy of the ſame *Roger Bacon*, in the hands of the Learned Dr. *Ger. Langbain*, late Provoſt of *Queens College*, were *Sulphur*, and *Carbonum pulvis*: concerning which, after a while he further adds: *Præter hæc* (i. e. *combuſtionem*) *ſunt alia ſtupenda naturæ, nam ſoni velut Tonitrus, & coruſcationes poſſunt fieri in aere, imo majore horrore, quam illa quæ fiunt per naturam: Nam modica materia adapta, ſc. ad quantitatem unius pollicis, ſonum facit horribilem & coruſcationem oſtendit violentem, & hoc fit multis modis quibus Civitas aut Exercitus deſtruatur. ---Igne exſiliente cum fragore inæſtimabili----Mira hæc ſunt ſi quis ſciret uti ad plenum in debitâ quantitate & materiâ.*

40. That is, that of *Salt-peter*, and other matters, *viz. Sulphur*, and the *duſt of coal*, he could make *fire* that ſhould burn at what diſtance he pleaſed; and further, that with the ſame matter he could make ſounds like *Thunder*, and coruſcations in the *air* more dreadful than thoſe made by *Nature*: For, ſays he, a little of this matter rightly fitted, though not bigger than ones Thumb, makes a horrible noiſe, and ſhews a violent coruſcation,

[b] Hiſtory of the Royal Society, *Part.* 2. *ſub finem.* [c] *In Epiſt. ad Pariſienſem. cap.* 6.

which

which may be ordered many ways; whereby a *City* or *Army* may be deſtroyed---the *Fire* breaking forth with an unſpeakable noiſe ----which are wonderful things, if a *man* knew exactly how to uſe them in due quantity and matter.

41. Whence 'tis plain, he either *invented* or knew *Gun-powder*, though I think we cannot allow him leſs than the firſt, till we find out an ancienter *Author* for it *, which if no body ever do's (as 'tis manifold odds they never will) in all probability it was *invented* hereat *Oxford*, where he made the reſt of his affrighten-ing *Experiments*. And that out of his works, *Conſtantinus Anckliz-zen* of *Friburg* [d], or *Bertholdus Swartz* [e], and the reſt of the *Improvers*, in all likelihood might have their pretended Inventions, though we allow him not quite ſo *explicit* as in the *Copy* of the Reverend and Learned Dr. *Langbain*, but that as 'tis conjectured by Dr. *Dee* [f], he ſomwhat concealed his Invention in the word [*aliis*] well knowing it might be dangerouſly deſtructive to *mankind*.

42. As for *Water-works* invented or improved in this *County*, ſome concern profit,and others only pleaſure. Of the firſt ſort,is an Inſtrument of Sir *Chriſtopher Wrens*, that meaſures the quantity of *Rain* that falls, which as ſoon as 'tis full, empties it ſelf, ſo that at the years end 'tis eaſie to compute how much has fallen on ſuch a quantity of *ground* for all that time; and this he contrived in order to the diſcovery of the *Theory* of *Springs*, *exhalations*, *&c.* And ſecondly, other Inſtruments whereby he has ſhewn the *Geometrical Mechanie* of *Rowing*, *viz.* that the *Oar* moves upon its *Thowle*,as a *vectis* on a yielding *fulcrum*, and found out what degree of *impediment* the *expanſion* of a body to be moved in a liquid *medium* ordinarily produces in all proportions, with ſeveral other matters in order for laying down the *Geometry* of *ſailing*,*ſwiming*, *rowing*, and the *fabrick* of Ships [g].

43. Hither alſo belong the *Locks* and *Turn-pikes* made upon the River *Iſis*, the 21 of King *James*, when it was made navigable from *Oxford* to *Bercot*, which are abſolutely neceſſary for that purpoſe, on ſhallow *rivers* that have alſo great *falls*, to keep up the *water*, and give the *veſſels* an eaſie deſcent. For the firſt where-

* *Baconus fatis conceſſit, Anno* 1292 near 100 years before any of the other pretended Inventions. [d] *Vid. Guid. Panciroll. rer. memorab. recens Invent. part.* 2. *tit.* 18. [e] *Vid. Steph. Forcatulum I. C. de Gallorum Imperio & Philoſoph. lib.* 4. *ſub finem.* [f] Dr. *Dees* Annotations in *Epiſt. ad Pariſienſem.* [g] Hiſtory of the Royal Society, *Part.* 2. *ſub finem.*

of,

of, provided the fall of water be not great, a *Lock* will ſuffice, which is made up only of bars of wood called *Rimers*, ſet perpendicularly to the bottom of the paſſage (which are more or leſs according to its breadth) and *Lock-gates* put down between every two of them, or boards put athwart them, which will keep a head of water as well as the *Turn-pike* for the paſſage of a *Barge*, but muſt be all pulled up at its arrival, and the water let go till there is an abatement of the fall, before the *boat* may paſs either down or upwards; which, with the ſtream, is not without violent precipitation; and againſt it, at many places, not without the help of a *Capſtain* at Land; and ſomtimes neither of them without imminent danger.

44. But where the declivity of the *Channel*, and fall of water is ſo great, that few *barges* could live in the paſſage of them, there we have *Turn-pikes*, whereof there are three between *Oxford* and *Bercot*; one at *Iſley*, another at *Sanford*, and a third at *Culham* in the *Swift-ditch*, which was cut at that time when the *River* was made navigable; and are all thus contrived. Firſt, there are placed a great pair of *Folding doors*, or *Flood-gates* of *Timber* croſs the *river*, that open againſt the ſtream and ſhut with it, not ſo as to come even in a ſtraight line, but in an *obtuſe angle*, the better to reſiſt and bear the weight of the *water*, which by how much the greater it is, by ſo much the cloſer are the *gates* preſſed; in each of which *Flood-gates* there is a *ſluce* to let the water through at pleaſure, without opening the *gates* themſelves. Within theſe, there is a large ſquare taken out of the *river*, built up at each ſide with Free-ſtone, big enough to receive the largeſt *barge* afloat; and at the other end another pair of *Flood-gates*, opening, and ſhutting, and having *ſluces* like the former. Which is the whole *Fabrick* of a *Turn-pike*.

45. At the uppermoſt pair of theſe *gates* the water is ſtopt, which raiſes it in the *river* above, and gives the *Veſſels* paſſage over the *ſhallows*, which when come to the *Turn-pikes*, the *Sluces* are firſt opened, and the water let in to the *ſquare* or incloſed ſpace between the two pair of *gates*, where it muſt neceſſarily riſe (the lower gates being ſhut) till at length it comes to be level with the ſurface of the *river* above: when this is done, the upper ſtream then making no ſuch preſſure on the *gates* as before, they are eaſily opened by two or three *men*, and the *Veſſels* let in

one at a time; which done, they ſhut thoſe upper *gates* and *ſluces* as before: Then they open the *ſluces* of the *gates* at the other end of the *Turn-pike*, and let the *water* by degrees out of the *incloſed ſquare* till it is ſunk down, and the *Veſſel* with it, level with the *river* below, and then open the *gates* themſelves, and let the *Veſſel* out; the upper *gates* all the while being drove too, and kept ſo faſt by the *water* above, that little of it can follow. And thus the *boats* go down ſtream.

46. But when they return, they are firſt let into the *incloſed ſpace* (where the *water* ſtands conſtantly level with that of the lower *channel*) at the lower *gates*, which as ſoon as ſhut again, the *ſluces* are opened at the uppermoſt *gates*, and the *water* let in, till it riſes with the *boat* upon it, to be equal with that of the *river* above: this done, the upper *gates* are eaſily opened as before, there being no preſſure upon them, and the *boat* let out. So that notwithſtanding the *Channel* has much ſteeper *deſcents* where theſe *Turn-pikes* are ſet, than at any of the *Locks*, yet the *boats* paſs at theſe with much more eaſe and ſafety. Notwithſtanding theſe proviſions, the River *Thames* is not made ſo perfectly *Navigable* to *Oxford*, but that in dry times, *barges* do ſomtimes lie aground three weeks, or a month, or more, as we have had ſad experience this laſt *Summer*; which in great meaſure no doubt might be prevented, were there a convenient number of *Locks*, or *Holds* for *water*, made in the River *Cherwel* above *Oxford*, to let down *flaſhes* as occaſion ſhould ſerve; and ſo again out of the River *Kennet* near *Reading*, the *Lodden*, *&c.*

47. Not impertinent hereunto is a contrivance for *Fiſh-ponds*, that I met with at the Right Worſhipful Sir *Philip Harcourt*'s at *Stanton Harcourt*, where the *ſtews* not only feed one another, as the *Ponds* of the Right Honorable the Earl of *Clarendon* at *Cornbury*, Sir *Timothy Tyrrils* at *Shot-over-Forreſt*, and the worſhipful *Brome Whorwoods* at *Holton*, *&c.* and may be *ſewed* by letting the water of the upper Ponds out into the lower; but by a *ſide Ditch* cut along by them, and *Sluces* out of each, may be any of them emptyed, without letting the *water* into, or giving the leaſt diſturbance to any of the reſt: which being a convenience that I never met with before, and perhaps unknown to many, I thought good to mention.

48. Amongſt

48. Amongſt the *Water-works* of Pleaſure, we muſt not forget an *Engine* contrived by the Right Reverend Father in God, *John Wilkins*, late Lord Biſhop of *Cheſter*, when he was *Warden* of *Wadham College*, though long ſince taken thence; whereby, of but few gallons of *water* forced through a narrow *Fiſſure*, he could raiſe a *miſt* in his *Garden*, wherein a perſon placed at a due diſtance between the *Sun* and the *miſt*, might ſee an exquiſite *Rainbow* in all its proper *colours*: which diſtance I conceive was the ſame with that aſſigned by *Des Cartes*, *viz.* where the Eye of the *Beholder* is placed in an angle of 42 degrees, made by the *decuſſation* of the line of *Viſion*, and the rays of the *Sun*; and the *Fiſſure* ſuch another as in his *Diagram* [h]. But what kind of *Inſtrument* it was that forced the *water*, I dare not venture to relate, the deſcription given me of it being but lame and imperfect.

49. Nor can I paſs by unmentioned, a *Clock* that I met with at *Hanwell*, at the Houſe of the Right worſhipful Sir *Anthony Cope*, that moves by *water*, and ſhews the *hours*, by the riſe of a new guilded *Sun* for every *hour*, moving in a ſmall *Hemiſphere* of wood, each carrying in their *Centers* the number of ſome *hour* depicted *black*; as ſuppoſe of *one* a clock, which aſcending half way to the *Zenith* of the *arch*, ſhews it a quarter paſt *one*, at the *Zenith* half *hour*; whence deſcending again half way towards the *Horizon*, three quarters paſt *one*; and at laſt abſconding under it, there preſently ariſes another guilded *Sun* above the *Horizon* at the other ſide of the *arch*, carrying in its *center* the figure *two*: and ſo of the reſt. Which ingenious device, though taken out of *Bettinus* [i], who calls it, *aquarii Automatis ingenioſiſſimi horariam operationem*: yet being ſince improved by that *ingenious Perſon*, and applyed to other uſes, particularly of a *Pſeudo-perpetual motion* made by the deſcent of ſeveral guilt *bullets* upon an *indented* declivity, ſucceſſively delivered by a wheel much of the ſame fabrick with the *Tympanum* of the *Water-clock*, ſo that they ſeem ſtill the *ſame*: I could not but in juſtice take notice of it.

50. There are ſome other *Water-works* at the ſame Sir *Anthony Copes*, in a Houſe of *diverſion* built in a ſmall *Iſland* in one of the *Fiſh-ponds*, Eaſtward of his houſe, where a *ball* is toſt by a *column* of *water*, and artificial *ſhowers* deſcend at pleaſure; within which they can yet ſo place a *candle*, that though one would think it muſt

[h] *Des Cartes Meteoror. cap.* 8. [i] *Marii Bettini Ærarii Philoſoph. Mathemat. Tom.* 2. *Exodio* 5. *& ult.*

needs be overwhelmed with *water*, it ſhall not be extinguiſht, *&c.* But the *Water-works* that ſurpaſs all others of the *County*, are thoſe of *Enſton*, at the *Rock* firſt diſcovered by *Tho. Buſhell* Eſq; about 4 or 5 and forty years ſince, who cleanſing the Spring then called *Goldwell*, though quite over-grown with bryars and buſhes, to place a *Ciſtern* for his own drinking, met with a *Rock* ſo wonderfully contrived by *Nature* her ſelf, that he thought it worthy of all imaginable advancement by *Art*.

51. Whereupon he made *Ciſterns*, and laid divers *Pipes* between the *Rocks*, and built a houſe over them, containing one fair *room* for *banquetting*, and ſeveral other ſmall *Cloſets* for divers uſes, beſide the *rooms* above; which when finiſht in the year 1636. together with the *Rock*, *Grove*, *Walks*, and all other the appurtenances, were all on the 23^{d} of *Auguſt*, by the ſaid *Tho. Buſhel* Eſq; preſented to the then *Queens* moſt excellent *Majeſty*, who in company with the *King* himſelf, was graciouſly pleaſed to honor the *Rock* not only with her *Royal* Preſence, but commanded the ſame to be called after *her* own *Princely* Name, *HENRIETTA*: At which time as they were entring it, there aroſe a *Hermite* out of the ground, and entertain'd them with a *Speech*; returning again in the cloſe down to his peaceful *Urn*. Then was the *Rock* preſented in a *Song* anſwer'd by an *Echo*, and after that a *banquet* preſented alſo in a *Sonnet*, within the Pillar of the Table; with ſome other Songs, all ſet by *Symon Ive*.

52. Which *ſtructure*, with all the Ingenious Contrivances about it, continued in a flouriſhing condition for ſome few years, till the late unhappy *Wars* coming on, it became wholly neglected, and ſo ſenſibly decayed, till at laſt it lapſed (being next door to ruine) into the Hands of the Right *Honorable* and truly *Noble Lord*, *Edward Henry* Earl of *Lichfield*, Lord of the *ſoil*; who in the year 1674. not only repaired the broken *Ciſterns* and *Pipes*, but made a fair addition to it, in a ſmall *Iſland* ſituate in the paſſage of a *Rivulet*, juſt before the building ſet over the *Rock*; which though the laſt in erection, is yet the firſt thing that preſents it ſelf in the exterior *Proſpect* of the whole work, *Tab.* 11. wherein the Figures,

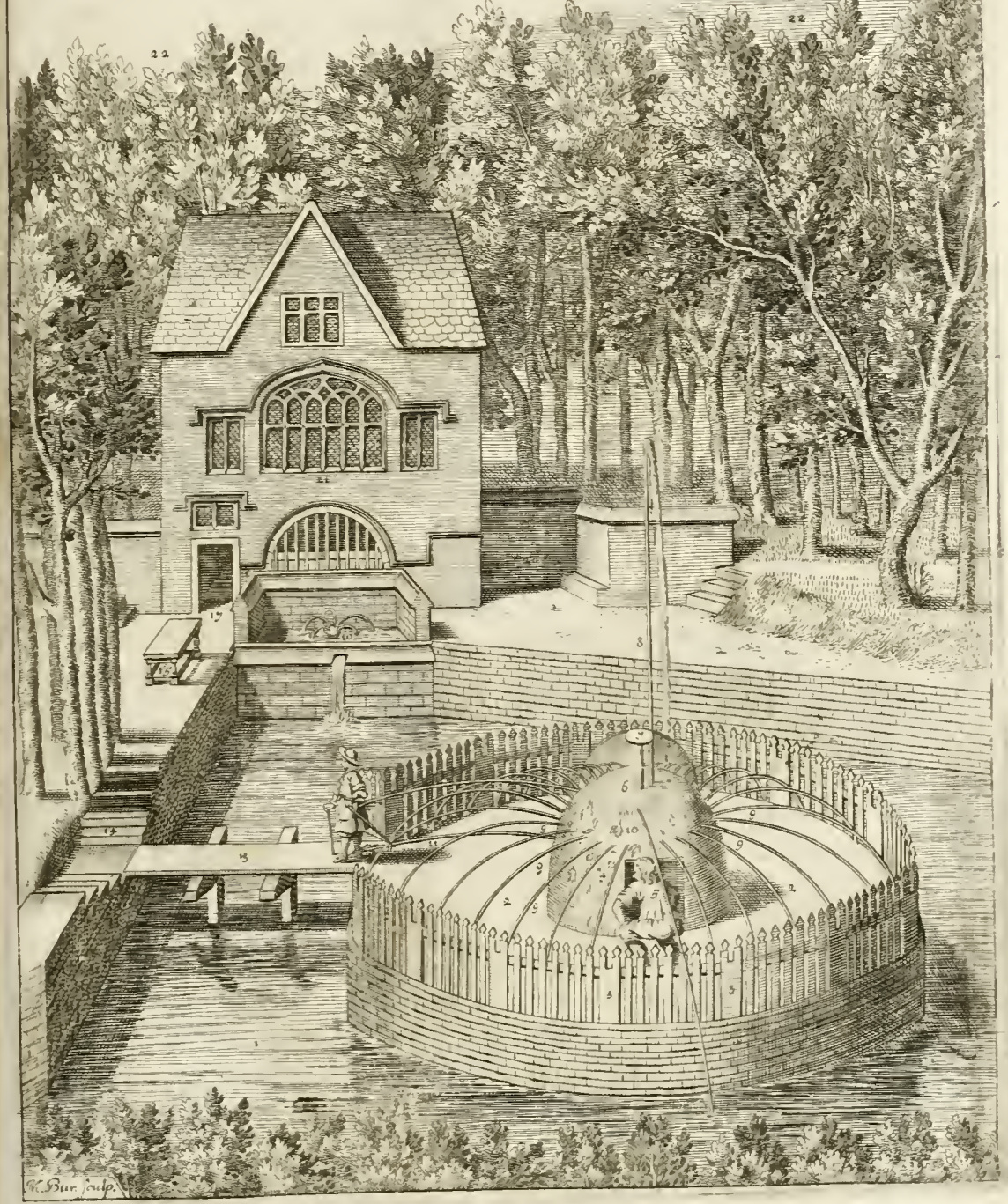
1. 1. *Shew the water of the* Rivulet.
2. 2. *The* Iſland *in the middle of it*,

3. 3. *the*

TAB. XI

ad pag. 237

To the right Honorable
Edward Henry Earle of
Lichfield Vicount MIDDLETON
and Baron of Spelsbury, &c
This Eleventh Table
Shewing the exterior Prospect of EASTON
Waterworks, in part erected, all restored
by his LORDSP with all imaginable
respect is justly dedicated.
by R. P. LL. D.



3. 3. *the* Pales *round it ſtanding on a ſtone wall.*
4. *An artificial* Rock *erected in the middle of the* Iſland, *covered with living aqueous* Plants.
5. *The* Keeper *of the Water-works that turns the* Cocks.
6. *A* Canopy *of water caſt over the* Rock, *by*
7. *an* Inſtrument *of* Braſs *for that purpoſe.*
8. *A* Column *of water riſing about* 14 *foot, deſigned to toſs a* Ball.
999999. *The ſtreams of* water *from about* 30 Pipes *ſet round the* Rock, *that water the whole* Iſland, *and ſportively wet any* perſons *within it; which moſt people ſtriving to avoid, get behind the* Man *that turns the* Cocks, *whom he wets with*
10. *a* ſpout *of* water *that he lets fly over his head; or elſe if they endeavor to run out of the* Iſland *over the bridge, with*
11. 12. *which are two other* Spouts, *whereof that repreſented at a* 11, *ſtrikes the* legs, *and that at* 12 *the* reins *of the back.*
13. *The* Bridge *over the water lying on two* treſtles.
14. *The* ſteps *leading into the* Grove, *and toward the* Houſe, *where you paſs by*
15. *a* Table *of black Marble.*
16. *A* Ciſtern *of ſtone, with five ſpouts of* water *iſſuing out of a* ball *of braſs, in which a ſmall* Spaniel *hunts a* Duck, *both diving after one another, and having their motion from the water.*
17. *The way up into the* banquetting-room *over the* Rock, *and other* Cloſets, &c.
18. *The paſſage between the* Ciſtern *and* Building.
19. *The iron grate that gives light to the* Grot *within.*
20. *The paſſage down to the* Grot.
21. *The windows of the* Banqueting-room.
22. *The* Grove *and* Walks *behind and on each end of the* Building.

53. Being now come down into the *Grot* by the paſſage 18, *Tab.* 11. and landing at the bottom of the *ſtairs*, *Tab.* 12. *a.* on a large *half pace* before it *bb.* The *Rock* preſents it ſelf made up of large craggy *ſtones* with great *cavities* between them, *ccc &c.* out of which flows *water* perpetually night and day, daſhing againſt the *Rocks* below, and that in great plenty in the dryeſt Seaſons, though

though fed only with a ſingle *ſpring* riſing in a piece of ground call'd *Ramſall*, between *Enſton* and *Ludſton*. The natural *Rock* is about 10 foot high, and ſo many in bredth; ſome few *ſhelves* of lead *d d*, and the top ſtones only having been added (eaſily to be diſtinguiſht by their *dryneſs*) which have advanced it in all about 14 foot high.

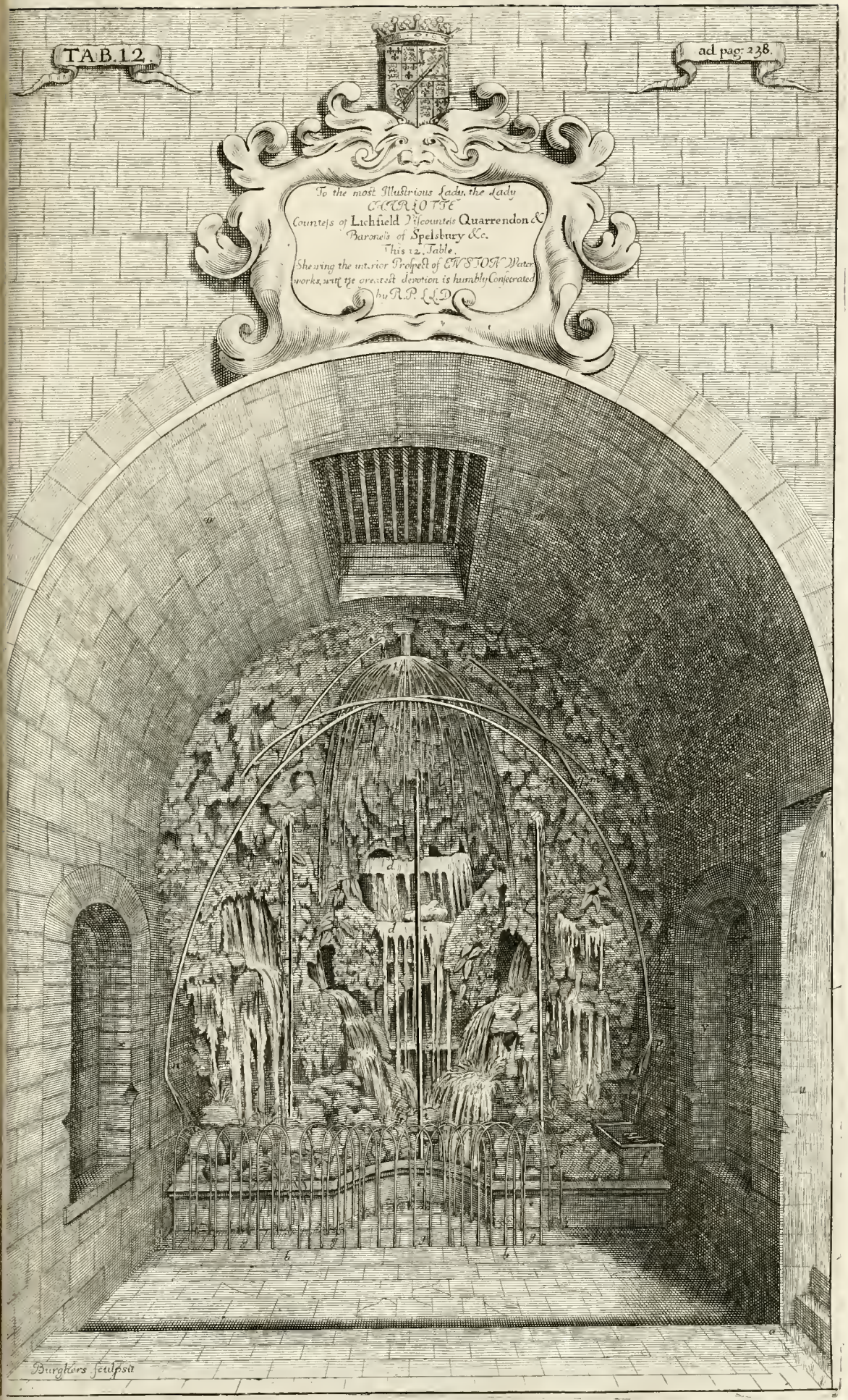
54. In the *half pace* juſt before the *Compartment e e e*, upon turning one of the *cocks* at *f* riſes a *chequer hedge* of *water*, as they call it, *g g g g*; and upon turning *another*, the two ſide *columns* of *water h h*, which riſe not above the height of the natural *rock*; and of a *third*, the middle *column i*, which aſcending into the *turn* of the *Arch*, and returning not again, is received into hidden *pipes* provided for that purpoſe: Into *one* whereof, terminated in a very ſmall *Ciſtern* of *water* behind a *ſtone* of the *rock*, and having a *mouth* and *Languet* juſt above its ſurface, the *air* being forced into it by the approaches of the *water*, a noiſe is made near reſembling the *notes* of a *Nightingale*: But when that *pipe* is filled there is then no more ſinging, till the *water* has paſt away by another *pipe* in the lower part of the *rock*, which when almoſt done, there is heard a *noiſe* ſomwhat like the ſound of a *drum*, performed by the ruſhing in of *air* into the hollow of the *pipe*, which is large, and of *copper*, to ſupply the place of the *water* now almoſt gon out; which don, the *Nightingale* may be made to ſing again.

55. From the turned *roof* of the *rock*, by help of the braſs *inſtrument k*, and turn of a cock in one of the *cloſets* above, they can let down a *canopy* of *water l l*; from the top alſo they can throw *arched ſpouts* of *water* croſſing one another, and daſhing againſt the walls, oppoſite to thoſe of their riſe, as at *m n* and *o p*; and *others* that riſe out, and enter in again to the *roof* at ſome diſtance, never falling down at all at *q r* and *s t*. Which falls of *water* may be alſo delicatly ſeen, turning the back upon them as well as looking forward, by help of a Looking-glaſs placed in the wall oppoſite to them, which could not be poſſibly repreſented in the *Cut*. And ſome of theſe *waters* (I muſt not ſay which) being often uſed by way of *ſport* to wet the *Viſitants* of the *Grot*, that they might not avoid it by running up the *ſtairs*, and ſo out into the *Grove*, by turning a cock in another of the *Cloſets*, they can let fall water ſo plentifully in the *door u u*, that moſt *people* rather

TAB. 12.

ad pag: 238.

To the most Illustrious Lady, the Lady
CARLOTTE
Countess of Lichfield Viscountess Quarrendon &
Baroness of Spelsbury &c.
This 12. Table.
Shewing the interior Prospect of WESTON Water
works, with the greatest devotion is humbly Consecrated
by R.P. LLD



Burghers sculpsit

ther chuſe to ſtay where they are, than paſs through it: which is all concerning the inner *Proſpect* of the Rock; what remains being only a repreſentation of the *Arch* of ſtone *w w* built over it, with two *Niches* *x y* one of each ſide, and the *grate* *z* at the top, through which they look down out of the *Banqueting-room* into the *Grot*. Of which no more, but that behind the Rock there is a *Cellar* for keeping *Liquors* cool, or placing *Muſick*, to ſurpriſe the *Auditors*; and behind that the *Receivers* of *water* to ſupply the *Pipes*, *&c.*

56. To theſe ſucceed the *Arts* relating to *Earths*, which either reſpect the *Tillage*, or *Formation* of them. How many ſorts of *Soils* I met with in *Oxfordſhire*, *viz.* *Clay*, *Chalk*, and others from their different *mixtures* called *Maum*, *Red-land*, *Sour-ground*, *Stone-braſh*, *Stony*, *Sandy*, and *Gravelly*, were enumerated amongſt *Earths*, Chap. 3. It remains that we here give a particular account, by what *Arts* they are tilled to the beſt advantage. And firſt of *Clay*,

57, Which if kind for *Wheat*, as moſt of it is, hath its firſt *tillage* about the beginning of *May*; or as ſoon as *Barly* Seaſon is over, and is called the *Fallow*, which they ſomtimes make by a *caſting tilth*, *i. e.* beginning at the out ſides of the *Lands*, and laying the *Earths* from the *ridge* at the top. After this, ſome ſhort time before the ſecond *tilth*, which they call *ſtirring*, which is uſually performed about the latter end of *June*, or beginning of *July*, they give this Land its *manure*; which if *Horſe-dung* or *Sheeps-dung*, or any other from the *Home-ſtall*, or from the *Mixen* in the Field, is brought and ſpread on the *Land* juſt before this *ſecond* ploughing: But if it be *folded* (which is an excellent *manure* for this *Land*, and ſeldom fails ſending a *Crop* accordingly if the *Land* be in *tillage*) they do it either in *Winter* before the *fallow*, or in *Summer* after it is *fallowed*. And theſe are the *manures* of *Clay* Land in the greateſt part of *Oxford-ſhire*, only in and near the *Chiltern*; where beſide theſe, it is much enriched by a ſoft mellow Chalk that they dig from underneath it: when it is *ſtirred* it lies again till the time of ſowing *Wheat*, except in a moiſt dripping *year*, when runing to *thiſtles* and other *weeds*, they ſomtimes give it a ſecond *ſtirring*, before the *laſt* for *ſowing*.

58. All which *tillages* they are very careful to give it as *dry* as may be, *ridging* it up twice or thrice for every *caſting tilth* (*i. e.* in their *ſtirring*, and for *ſowing*, beginning at the top of the *Land* and

and laying the *Earth* ſtill upwards to the *ridge*) by which means both *Land* and *Corn* lie dryer, warmer, and healthier, and the ſucceeding *Crop* becomes more free from *weeds*. After it is thus prepared, they ſow it with *Wheat*, which is its proper *grain*; and if it be a ſtrong ſtiff *Clay*, with that they call *Cone-wheat*: and the next year after (it being accounted advantagious in all *tillage* to change the *grain*) with *Beans*; and then ploughing in the *bean-bruſh* at *All-Saints*, the next year with *Barly*; and amongſt the ſeveral ſorts of that *grain*, if the Land be rank, with that they call *ſprat-Barly*; and then the fourth year it lies *fallow*, when they give it *Summer tilth* again, and ſow it with *Winter Corn* as before. But at moſt places where their *Land* is caſt into three *Fields*, it lies *fallow* in courſe every *third* year, and is ſown but *two*: the firſt with *Wheat*, if the Land be good, but if mean with *Miſcellan*, and the other with *Barly* and *Pulſe* promiſcuouſly. And at ſome *places* where it lies out of their *hitching*, *i. e.* their Land for *Pulſe*, they ſow it but every ſecond year, and there uſually two Crops *Wheat*, and the third *Barly*, always being careful to lay it up by *ridging* againſt *winter*; *Clay* Lands requiring to be kept high, and to lie warm and dry, ſtill allowing for *Wheat* and *Barly* three *plowings*, and ſomtimes four, but for other *grains* ſeldom more than *one*. When at any time they *ſow* Peas on this Land, the beſt Husbandmen will chuſe the *Vale-gray* as moſt proper for it; and if *Vetches*, the *Gore* or *Pebble-vetch*: But if ſo cold a *weeping Clay* that unfit for theſe, then they improve it with *Ray-graſs*.

59. As for the *Chalk-lands* of the *Chiltern-hills*, though it requires not to be laid in *ridges* in reſpect of *dryneſs*, yet of *warmth* it doth: when deſigned for *Wheat*, which is but ſeldom, they give it the ſame *tillage* with *Clay*, only laying it in *four* or *ſix* furrow'd *Lands*, and *ſoiling* it with the beſt *mould*, or *dung* but half rotten, to keep it from *binding*, which are its moſt proper *manures*; and ſo for *common Barly* and *winter Vetches*, with which it is much more frequently *ſown*, theſe being found the more ſuitable *grains*. But if it be of that pooreſt ſort they call *white-land*, nothing is ſo proper as *ray-graſs* mixt with *Non-ſuch*, or *Melilot Trefoil*, according as preſcribed in *Chap.* 6. §. 33.

60. If the *Land* be of that ſort they call *Maumy*, conſiſting of a mixture of *White-clay* and *Chalk*, and ſomwhat of *Sand*, which cauſes it to work ſo ſhort if any thing dry, it is commonly ſown with

with all ſorts of *Wheat*, *Miſcellan*, *Barly*, *&c.* having the ſame *tillage*, and requiring to be kept high, and to lie dry and warm as the *Clay* doth, only its moſt proper *manure* is the *rotteneſt* dung; and as they ſow *Beans* next after *Wheat* in *clay* grounds, in this they judge *Peas* a more agreeable *grain*, and take care in their *ſeed-time* that the weather be fair, and ſetled; for if there happen but a ſmart ſhower preſently after they have ſown, it will bind ſo faſt, that the *ſeed* in great part will be utterly loſt; whereas if they have but one or two dry nights, all ſucceeds well enough.

61. If *Red-land*, whereof there are ſome quantities in the *North* and *Weſt* of *Oxford-ſhire*, it muſt have its *tillage* as ſoon in the year as poſſibly may be, before the *clay*, where they are in competition, becauſe it will not endure the ſcorching *tillage* that *clay* will do, and therefore muſt have it before the *Sun* get to near the *Crab*: if it be moiſt when *fallowed*, ſo it be not too wet, it is the better. This never requires a double *ſtirring*, nor muſt be made too *fine* and *light*, for then it runs to *May-weed*, or *Mathern*, as they call it; yet the *manure* for *clay* does very well with it, but the mixt *manure* of *Horſe-dung* and *Cow-dung* together, they ſay does beſt of any: Nor is the *Sheep-fold* amiſs either *Winter* or *Summer*, which muſt all be applyed before *ſtirring*, and ploughed in; if for *wheat*, about the latter end of *July*, or beginning of *Auguſt*; if for *barly*, later in the *year*, as the time and *ſeaſon* gives leave. This Land, like *clay*, bears *wheat*, *miſcellan*, *barly*, and *peas*, in their order very well, and lies *fallow* every other *year*, where it falls out of their *hitching*.

62. There is another ſort of ground in this *County* which they call *Sour-land*, which muſt have its *tilth* according to its ſtate and condition when they ſet about it; if it have a ſtrong *ſwarth* on it, then they caſt to give it a *fallow*, when the *Sun* is prety well enter'd *Cancer*; and this they call a *ſcalding-fallow*, which kills the graſs roots, and makes the *Land* fine: But if it be *light*, and as they term it, hath *little skin on the back*, they either leave it for cooler *tillage*, or plough it *early* in the *year* as ſoon as their *clay* is *fallowed*, and then there will *ſpring* ſome *ſpiring-graſs* that will keep it from ſcorching in the *Summer*; for if they ſuffer it to be *ſcorched* when it is *light* before, all their *Art* and *Manure* will never procure a good *Crop* of it.

63. The *Sheep-fold* is good for this Land *winter* and *ſummer*, they *manure* it alſo with the Dung-cart, if near home, before the *ſtirring*; but *Pidgeons* dung is the moſt proper for this ſort of *ſoil*, becauſe it is for the moſt part very *cold Land*, and ſo is *Mault-duſt* in a larger quantity, both ſown with the *winter-corn* and ploughed in with it, for then it lies warm at the roots of the *Corn* all *winter*, and corrects the *crudities* of the *rains* and *froſts*, makes the *Corn* cover the ground ſooner than ordinary, and holds the moiſture of the *Spring* longer with it; and in ſhort (if thus ordered) brings a certain *Crop*. It muſt not be ſtirred or ſown very wet, for then it proves uneaſie both for *Man* and *Beaſt*, nor will it be kind for *Corn*, it being then very hard to cover it with the *harrows*. It is a good *Land* for *wheat* or *miſcellan*, when it is fine, eſpecially if in condition for a *ſcalding fallow*, and accordingly is ſown with that and *barly* by turns to change the *grain*; and when it falls in a *Peas* quarter, ſeldom fails of a good *burthen*, though ſomtimes it doth not *kid* very well, which yet poſſibly may be prevented by ſowing the *Cotſwold Pea*, which I gueſs the moſt agreeable to this ſort of *ground*: But if too wet for theſe, the *rath-ripe Vetch* is fitteſt for it.

64. In ſome parts of the *County* they have another ſort of *Land* they call *Stone-braſh*, conſiſting of a light lean *Earth* and a ſmall *Rubble-ſtone*, or elſe of *that* and *ſour ground* mixt together, which are alſo tilled according to their preſent condition; for if they be *graſie*, which they otherwiſe call *ſwardy*, they *fallow* them pretty late, but not ſo *hot* and *ſcorching* as *ſour ground*, becauſe they will not bear ſuch *tillage*: But if they be *ſcary*, as they word it, *i. e.* have no *skin* or *ſward* upon them, they either fold them in *winter*, and the *ſheeps dung* with addition of ſome *hay ſeeds*, will help them to get *graſie*; or elſe they lay upon them in the beginning of the *ſpring*, old *thatch* or *ſtraw*, or the moſt *ſtrawy* part of the *dung-hill*, *earth* out of *ditches*, the *ſhovelings* of a dirty *Court*, or the like, which ſpread thin will aſſiſt the graſs in its growth; which muſt neceſſarily be had, for they hold it (in ſome parts of the *County* at leaſt) for a general Rule, that if theſe ſorts of *Land* have not *ſward* on them before they are *fallowed*, they will by no means bring a kind *Crop*, but great ſtore of *Mony-wort*, *May-weed*, *&c.*

65. This done in *September*, *October*, *November*, and ſomtimes

in

in *December*, they *fallow* them as their *ſwards* direct, and if in either of the two laſt *months*, are called *Winter-fallows*, and are never ſtirred at all, but ſowed with *Barly* upon the ſecond *earth* in the beginning of *ſowing*, becauſe then they work moſt kindly, and will bear cold weather better than when more finely *tilled*. Theſe *Lands* will alſo bear *Wheat* and *Miſcellan* indifferently well in a kind *year*, but not ſo well as *clay*, *ſour-ground*, or *red-land*; but they bear a fine round *barly* and thin ſkin'd, eſpecially if they be kept in *heart*: They lie every other year *fallow* (as other *Lands*) except where they fall among the *Peas* quarter, and there after *Peas* they are ſown with *Barly*, and lie but once in four years. Theſe are ſown alſo many times with *Dills* or *Lentils*, and when quite worn out, or ſo poor that they will bear nothing elſe to advantage, they are yet fit for *Ray-graſs* mixt with *Trefoil*, as preſcribed above in the Chapter of *Plants*.

66. There is a ſort of *tillage* they ſomtimes uſe on theſe *Lands* in the *ſpring* time, which they call *ſtreak-fallowing*; the manner is, to plough *one* furrow and leave *one*, ſo that the *Land* is but half of it ploughed, each ploughed furrow lying on that which is not ſo: when it is *ſtirred* it is then clean ploughed, and laid ſo ſmooth, that it will come at ſowing time to be as plain as before. This is done when theſe *Lands* are not *ſwardy* enough to bear clean *tillage*, nor *callow* or light enough to lie to get *ſward*, the intent is to keep the *Sun* from ſcorching them too much: But in moſt places they think this way of *tillage* wears their *Land* too faſt, and therefore ſeldom uſe it.

67. As for *ſtony Land*, whereof there is but little can be properly ſo called but in the *Chiltern Country*, they give it for *Wheat*, *Peas*, and *Barly*, much the ſame *tillage* and *manure*, they do *Clay* in other places, adding the advantage of *chalking* it, which they have not elſewhere for their *clay grounds*, by which they much enrich it for ſome years, ſo that it bears excellent *wheat*, *barly*, *peas*; of which laſt thoſe they call *Hampſhire-kids*, if the Land be new chalkt, are counted moſt agreeable; where by the way let it be noted, that I ſaid but for ſome years, for when once the *manure* by chalk is worn out, the Land is ſcarce recoverable by any other, whence 'tis *Proverbial* here, as well as ſome other parts of *England*, That *chalkt Land* makes a rich *Father* but a poor *Son*, thereby intimating the ruin of the Land in the end, it becoming

at laſt only fit for *Ray-graſs*, mixt with *Trefoil* as above.

68. Laſtly, their *ſandy* and *gravelly* light ground, has alſo much the ſame tillage for *wheat* and *barly*, as *clay*, *&c.* only they require many times but *two* ploughings, eſpecially if for *wheat*, except the *fallow* be run much to *weeds*, and then indeed they ſomtimes afford it a *ſtirring*, elſe none at all. Its moſt agreeable *grains* are, *white*, *red*, and *mixt Lammas wheats*, and *miſcellan*, *i. e. wheat* and *rye* together, and then after a years fallow, *common* or *rathe-ripe barly*: ſo that it generally lies ſtill every other *year*, it being unfit for *hitching*, *i. e. Beans* and *Peas*, though they ſomtimes ſow it with *winter Vetches*; and if ever with *Peas*, the ſmall *rathe-ripes* are accounted the beſt: Its moſt agreeable *manure* is of ſtraw, from the *Cloſe* or *Mixen* half rotten, which keeps it open, and ſuffers it not to bind too much, where ſubject to it; but if otherwiſe, the rotteneſt *dung* is the beſt.

69. Whereof, as upon all other *Lands* before mention'd, they lay about 12 *loads* upon a common Field *acre*, *i. e.* about 20 upon a Statute *acre*; but I find the buſineſs of manuring *Land* to have a great *latitude*, Men doing it here many times not according to their *judgment*, but according to the *quantities* they have, ſo that where the quantities of *manure* are but ſmall and the *tillage* is great, the caſe is much otherwiſe, than where both *tillage* and *manure* are in a contrary condition. But however the caſe ſtand, I find this a general Rule amongſt them, that they always *ſoil* that *Land* firſt and beſt, which is to bear three *Crops*; one on the *tillage*, another of *beans* and *peas*, and a third of *barly*, on the *beans* or *peas* bruſh; all which depend upon the ſingle *manure* given it when it lay *fallow* for *wheat*: though I have known this order frequently inverted by the beſt *Husbandmen* on their richeſt *Lands*, ſowing *barly* firſt, then *peas* or *beans*, and their *wheat* laſt, for which they allege this very good reaſon, That *wheat* following the *dung Cart* on their beſt Land, is the more liable to *ſmut*.

70. And ſo much for the ordinary *Manures* of this *County*, there being two *others* yet behind, *viz. Chippings* of *Stone*, and *woolen rags*, not altogether ſo common, which I have therefore thought fit to conſider apart; the *firſt* whereof I met with at *Hornton* near *Banbury*, where the *chippings* of the *ſtone* they hew at their *Quarry*, proves a very good *manure* for their Ground thereabout, and is accordingly made uſe of, by reaſon no doubt of a *ſalt* that *ſtone* holds

holds, which being diſſolved by the *weather*, is imbibed by the *Earth*, as hinted before in *Chap.* 4. of this *Eſſay*.

71. The 2d ſort I firſt obſerved about *Watlington*, and the two *Britwels*, where they ſtrew them on their Land with good ſucceſs; & I have heard ſince of ſeveral other *places* where they do the ſame. To this purpoſe they purchaſe *Taylers* ſhreds, which yet retaining ſomwhat of the *ſalt* of the *Fulling-earth* with which they were dreſt, do well enough; but I judge them not ſo good as other old *rags* firſt worn by *men* and *women*, which muſt needs beſide be very well ſated with *urinous ſalts*, contracted from the *ſweat* and continual *perſpiration* attending their *Bodies*. And in this Opinion I am confirmed by *Sanct. Sanctorius*, who is poſitive, that *our inſenſible evacuations, tranſcend all our ſenſible ones put together* [k], to that exceſs, *that of eight pounds weight of meat and drink be taken by a man in one day, his inſenſible tranſpirations uſe to amount to five* [l]. Now if ſo, our *cloaths* muſt needs be ſo filled with a well rectified *ſalt*, left behind in the *percolation* of the *ſteams* of our *bodies*, that there can be nothing more rational, if well conſidered, then that they ſhould be a very fit *manure* for Land, when unfit for other uſes.

72. As to the *quantities* of *Corn* ſown on the *ſtatute Acre*, they differ much in proportion to the richneſs or meanneſs of the *land*; about two *buſhels* of *wheat* and *vetches*, two *buſhels* and ½ of *barly*, *oats*, and *peas*, and a quarter of *beans* ſufficing the poorer; whereas the richer *Land* will take up three *buſhels* or more of *wheat* or *vetches*, three *buſhels* and ½ or upwards of *barly*, *oats*, *peas*, and ſomtimes ſix *buſhels* of *beans*: Yet I have known ſome able *Huſbandmen* afford more Seed to their poor than rich Land, giving this reaſon, That the Seed in the rich does *tillar*, *i. e.* ſprout into ſeveral *blades* and ſpread on the ground, whereas on the poor Land its ſprouts come all ſingle, which therefore, ſay they, requires the more *ſeed*.

73. In the choice of their *ſeed* they have a double reſpect, firſt to the *grain* it ſelf, and ſecondly to the *land* it grew on. As to the *firſt*, they take care that it be clear of all manner of *ſeeds*; that it be handſom round *Corn*, of an equal cize, which ſome of them call *Even ſhooting Corn*, or *well breſted*; ſuch *Corn* being for the moſt part full of *kernel*, and the likelieſt to give ſtrong *roots*.

[k] *S. Sanctorii Medicinæ Staticæ, Lib.* 1. *ſect.* 1. *Aphoriſm.* 4. [l] *Ibid Aphoriſm* 6.

And

And in reſpect of the *ſoil*, they conſtantly chooſe *Corn* that grew on *land* of a quite different nature from that it is to be *ſown* on; but in general, they deſire it from *land* that is well in *heart*, and rich in its kind. If they are to ſow *wheat* upon *tillage*, they chooſe *wheat* ſown before upon *bean ſtubs*, and when they ſow upon *peas* or *bean ſtubs*, *wheat* ſown before on *tillage*; for *Clay* ground they have their *ſeed* from *Red-land* or *Chalk*, *& vice verſa*; for the other *ſoils*, that from *Clay* is eſteemed the beſt, though that from *Red-land* is little inferior; for *barly* they count that beſt which comes of new broken *laud*; and for the reſt, none ſo good as thoſe that come from the richeſt *ſoils*.

74. Before they ſow, if the place be ſubject to the annoyances of *Smutting*, *Meldews*, *Birds*, *&c.* they take care to prevent them either in the preparing or choice of their *grain*. Againſt *ſmutting* they both *brine* and *lime* their *Corn*, ſome making their *brine* of *urin* and *ſalt*; or elſe ſow *red-ſtraw'd wheat*, which is the leaſt ſubject to it of any. To prevent *meldews*, ſome ſow prety early, judging *Corn* moſt ſubject to that annoyance when ſown late; or elſe make choice of the *long bearded Cone*, that being the leaſt ſubject of any *wheat* yet known to the inconveniencies of *meldews*, and of being eaten by *Birds*, and therefore alſo fitteſt to be ſown in ſmall *Incloſures*, as noted before in the ſixth Chapter.

75. In Sowing they have their ſeveral methods, *viz*, the *ſingle Caſt*, the *double Caſt*; and as they call it about *Burford*, the *Hackney bridle*, or *riding Caſt*. The *ſingle Caſt* ſows a Land at one bout; the *double Caſt* is twice in a place, at two different bouts, *viz*. once from *furrow* to *ridge*, and afterwards from *ridge* to *furrow*. The *Hackney bridle* is two caſts on a Land at one time, and but once *about*, though I find theſe two latter ſomtimes confounded, their *names* being interchangably applyed in different parts of the *County*. The *firſt* way is ſeldom uſed amongſt them, only by the ancienteſt *Seeds-men*; the *ſecond* is their uſual and moſt certain way; the *laſt*, though the neweſt faſhion, is but ſeldom uſed yet, though ſome have tryed it with good ſucceſs, and perhaps may hereafter bring it more in practice, it having more ſpeed than the *double Caſt* to recommend it to uſe. They have alſo a way of ſowing in the *Chiltern Country*, which is called ſowing *Hentings*, which is done before the *Plough*, the *Corn* being caſt in a ſtraight line

juſt

juſt where the *plough* muſt come, and is preſently *plougbed* in. By this way of *ſowing* they think they ſave much *ſeed* and other charge, a dexterous *Boy* being as capable of ſowing this way out of his *hat*, as the moſt judicious *Seeds-man*. But of this way more hereafter, when I come into *Buckingham-ſhire*.

76. Thus having run through, the *Tillage*, *Manures*, *Quantities* and choice of *Seed*, and the ſeveral ways of ſowing the *Soils* of this *County*, I proceed to the *Inſtruments*, uſed in their *tillage*: Amongſt which, the *Plough* being the beſt, becauſe the moſt uſeful *Engine* in the World, deſerves the firſt place; of which there are two ſorts uſed in *Oxford-ſhire*, the *Foot*, and *Wheel-plough*; whereof the firſt is uſed in deep and Clay Lands, being accordingly fitted with a *broad fin* ſhare, and the *Horſes* going always in a *ſtring* and keeping the *furrow*, to avoid poching the Land; and the *ſecond* in the lighter and ſtony Land, the *Horſes* either going in a *ſtring*, or two a breaſt, according as thought moſt ſuitable to the *tillage* in hand [m]: This *Plough* when uſed in ſtony Land, is armed with a *roundpointed* ſhare, having alſo near the *chep* of the *Plough* a ſmall *fin* to cut the roots of the graſs, for in this Land the *broad fin* jumps out of the ground. The *foot plough* does beſt at the *henting*, *i.e.* ending of a Land, it going cloſe up to a *hedge*, and not being ſubject to over-throw; whereas the *wheel plough*, if care and diſcretion do not meet in the *holder*, is apt to overthrow there, the Land being ridged; but goes much more lightſom and eaſie for the *Horſes* than the *foot plough* doth, which is the ſum of the Conveniencies and Inconveniencies of both.

77. After *Ploughing* and *Sowing*, they cover their *Corn* with *Harrows*, whereof ſome have 4, 5, or 6 *bulls*, or *ſpars* apiece, each of them armed with five *tines*, and of a ſquare form as at moſt other *places*. But at *Whitfield*, near Sir *Thomas Tippings*, I ſaw a great weighty *triangular Harrow*, whoſe *tines* ſtood not in rows after the manner of *others*, its uſe being in ground much ſubject to *Quitch-graſs*, whoſe roots it ſeems continually paſſing between the *tines* of other *Harrows*, are not ſo eaſily dragged forth by them, as this, whoſe *tines* ſtand not in *rows*, and is drawn with one of the *Angles* fore-moſt, after the manner of a *Wedge*: Yet I could not find it anſwer'd expectation ſo well as to obtain in other places, moſt thinking the *great ſquare Bull harrow*, drawn by the ſecond

[m] On light Land ſome count the treading of double Cattle advantagious to it.

bull

bull on the *near ſide* of the *harrow*, to take the Graſs much better than that.

78. But the worſt ground to *harrow* of all others is new *broken Land*, the parts of its furrows being commonly ſo faſt knit together by the roots of the graſs, that though great charge and trouble be afforded in the *harrowing*, yet after all it will not ſo *diſperſe* the *Corn*, but that it will come up as it fell, thick and in ranks between the *furrows*, and ſcarce any where elſe. To prevent theſe inconveniencies, the Ingenious Mr. *Sacheverel*, late of *Bolſcot*, deceaſed, contrived a way of *howing* the *earth* from the *turf* as ſoon as a little dryed, thereby firſt laying his ground even and then ſowing it; by which means his *ſeed* not only fell and came up equally diſperſt in all parts alike, but he found that a quantity conſiderably leſs, did this way ſerve the turn. Which *Experiment* he often made with good approbation, the charge of *howing* not exceeding that of *harrowing*, which without it muſt be great, whereas after it, one *croſs tine* covers the *Corn* well enough.

79. After *harrowing*, if it hath been ſo dry a time, that the ground has riſen in *clods* that cannot be broken with *harrows*, they commonly do it with a *beetle*, or *big ſtick*: But a much quicker way is that I met with about *Biſſeter* by a weighty *Roll*, not cut round, but *octangular*, the edges whereof meeting with the *clods*, would break them effectually, and with great expedition. I was ſhewed alſo at *Bolſcot* another uncommon *Roll*, invented by the ſame Mr. *Sacheverel* above-mentioned, cut neither *ſmooth* nor to *angles*, but notched deep and pretty broad, after the manner of a *Teſſella* or *Lattice*, ſo that the protuberant parts remained almoſt as big as the foot of a *Horſe*, by which being large and weighty, he could ſo firmly preſs his *light Land* ſubject to *Quich-graſs* and other *weeds*, and ſo ſettle the roots of the *Corn*, that it would come up even and well; whereas if it had been left hollow it would certainly have been choaked, and came to little; He aſſerted, that it alſo excelled a ſmooth *Roll*, eſpecially if the Seaſon proved dry and windy, in that, when a Field is *rolled* ſmooth, the *wind* is apt to blow the *Earth* from the *Corn*, whereas by this the ground is laid ſo uneven and full of holes, like *Chequer-work*, that what the wind blows from the *ridges*, ſtill falls into the *hollows* between them, and on the contrary gives the *Corn* the better root.

80. I have

80. I have heard of another ſort of *Roll*, of a large *diameter*, and weighty, ſet the whole length with edged plates of *ſteel*, prominent from the body of the *Roll* about an inch and half; thus contrived for the quicker cutting of *turf*, which drawn firſt one way, and croſs again at *right angles*, cuts the *turf* into ſquares, in bigneſs proportionable to the diſtance of the edged *plates* on the *Roll*, requiring no farther trouble afterward, then to be pared off the ground with a *turfing Spade*, which ſeems to promiſe well for the cutting out of *Trenches*, *Drains*. *&c.* But this I have not ſeen, nor has it that I know of, been yet experimented by the ingenious *Inventor*: However, I thought fit to offer it to the conſideration of *Improvers*, and the rather becauſe it affords me a ſmooth tranſition from the conſideration of the *Arable*, to the *Meddow* and *Paſture Lands*.

81. For the *Meddow grounds* of this *County*, as they are numerous, ſo they are *fertile* beyond all *preference*, for they need no other *compoſt* to be laid on them, than what the *Floods* ſpontaneouſly give them, and therefore the *Reader* muſt not expect any methods or rules concerning that affair here: Nor concerning the *remedies* of annoyances, ſuch as *Sour-graſs*, *Moſſes*, *Ruſhes*, *Sedges*, *&c.* for I find none of our *meddows* much troubled with them. As for their *Up-lands*, when they prepare them for *graſs*, they make them as rich as they can with their moſt ſuitable *ſoils*, and lay them alſo dry to keep them from *Ruſhes* and *Sedges*; if any thing *boggy*, they uſually *trench* them; but that proves not ſufficient, for the *trenches* of *boggy grounds* will ſwell, and fill up of themſelves.

82. To prevent which inconveniency, I know an ingenious *Husbandman*, that having dug his *trenches* about a yard deep and two foot over, firſt laid at the bottom green *Black-thorn* buſhes, and on them a *ſtratum* of large round ſtones, or at leaſt ſuch as would not lie cloſe; and over them again, another *ſtratum* of *Black-thorn*, and upon them *ſtraw*, to keep the dirt from falling in between, and filling them up: by which means he kept his *trench* open, and procured ſo conſtant and durable a *drain*, that the *land* is ſince ſunk a foot or 18 inches, and become firm enough to ſupport *carriages*.

83. As for the *Graſſes* ſown in this *County*, I have little more to add concerning them, but what was ſaid before in the Chapter

of *Plants*, only that it has been found moſt agreeable that *Sanfoin*, *Ray-graſs*, &c. be not ſown preſently after the *Barly*, *Oats*, or whatever other *Grain* it be ſowed with, but rather after the *Corn* is come pretty high, ſo that it may ſhelter the *ſeed* from the heat of the *Sun*, which, as is apprehended at leaſt, is ſomtimes prejudicial. And that in the *Chiltern Country*, after they have eaten off their *Ray-graſs* or *Sanfoin*, they find it advantagious to *fold* it with *Sheep*, as other *Corn-lands*: which I thought good to note, it being, as I am informed, but lately practiſed.

84. Amongſt *Arts* that concern *formation* of *Earths*, I ſhall not mention the making of *Pots* at *Marſh-Balden*, and *Nuneham-Courtney*; nor of *Tobacco-pipes* of the *White-earth* of *Shot-over*, ſince thoſe places are now deſerted. Nor indeed was there, that I ever heard of, any thing extraordinary performed during the working thoſe *Earths*, nor is there now of a very good *Tobacco-pipe Clay* found in the Pariſh of *Horſpath*, ſince the Printing of the third *Chapter* of this *Hiſtory*. Let it ſuffice for things of this *nature*, that the ingenious *John Dwight*, M. A. of *Chriſt Church College Oxon.* hath diſcovered the *myſtery* of the ſtone or *Cologne* Wares (ſuch as *D'Alva Bottles*, *Jugs*, *Noggins*) heretofore made only in *Germany*, and by the *Dutch* brought over into *England* in great quantities, and hath ſet up a *manufacture* of the ſame, which (by *methods* and *contrivances* of his own, altogether unlike thoſe uſed by the *Germans*) in three or four years time he hath brought it to a greater perfection than it has attained where it hath been uſed for many *Ages*, inſomuch that the *Company* of *Glaſs-ſellers*, *London*, who are the *dealers* for that *commodity*, have contracted with the *Inventor* to buy only of his *Engliſh manufacture*, and refuſe the *foreign*.

85. He hath diſcovered alſo the *myſtery* of the *Heſſian wares*, and makes Veſſels for reteining the penetrating *Salts* and *Spirits* of the *Chymiſts*, more ſerviceable than were ever made in *England*, or imported from *Germany* it ſelf.

86. And hath found out *ways* to make an *Earth* white and tranſparent as *Porcellane*, and not diſtinguiſhable from it by the *Eye*, or by *Experiments* that have been purpoſely made to try wherein they diſagree. To this *Earth* he hath added the *colours* that are uſual in the colour'd *China-ware*, and divers others not ſeen before. The ſkill that hath been wanting to ſet up a *manufacture*

ſture of this tranſparent *Earthen-ware* in *England*, like that of *China*, is the *glazing* of the white *Earth*, which hath much puzzel'd the *Projector*, but now that difficulty alſo is in great meaſure overcome.

87. He hath alſo cauſed to be modelled *Statues* or *Figures* of the ſaid tranſparent *Earth* (a thing not done elſewhere, for *China* affords us only imperfect *mouldings*) which he hath diverſified with great variety of *colours*, making them of the *colours* of *Iron*, *Copper*, *Braſs*, and *party-colour'd*, as ſome *Achat-ſtones*. The conſiderations that induced him to this attempt, were the *Duration* of this hard burnt *Earth* much above *braſs*, or *marble*, againſt all *Air* and *Weather*; and the ſoftneſs of the matter to be *modelled*, which makes it capable of more curious work, than *ſtones* that are wrought with *chiſels*, or *metals* that are caſt. In ſhort, he has ſo far advanced the *Art Plaſtick*, that 'tis dubious whether any man ſince *Prometheus* have excelled *him*, not excepting the famous *Damophilus*, and *Gorgaſus* of *Pliny*[n].

88. And theſe *Arts* he employs about materials of *Engliſh* growth, and not much applyed to other uſes; for inſtance, He makes the ſtone *Bottles* of a *Clay* in appearance like to *Tobacco-pipe clay*, which will not make *Tobacco-pipes*, though the *Tobacco-pipe clay* will make *Bottles*; ſo that, that which hath lain buryed and uſeleſs to the *Owners*, may become beneficial to them by reaſon of this *manufacture*, and many working hands get good livelyhoods; not to ſpeak of the very conſiderable *ſums* of *Engliſh Coyn* annually kept at home by it.

89. About *Nettle-bed* they make a ſort of *brick* ſo very ſtrong, that whereas at moſt other places they are unloaded by hand, I have ſeen theſe ſhot out of the *Cart* after the manner of *ſtones* to mend the *High-ways*, and yet none of them broken; but this I ſuppoſe muſt be rather aſcribed to the nature of the *Clay*, than to the *skill* of the *Artificer* in making or burning them, and ſhould therefore have been mention'd in the *Chapter* of *Earths*.

90. At *Caverſham*, near the Right Worſhipful Sir *Anthony Cravens* (and at ſome other places) they make a ſort of *brick* 22 inches long, and above ſix inches broad, which ſome call *Lath-bricks*, by reaſon they are put in the place of the *Laths* or *Spars* (ſupported by *Pillars*) in *Oaſts* for drying *mault*, which is

[n] *Nat. Hiſt. lib.* 35. *cap.* 12.

the only uſe of them, and in truth I think a very good one too; for beſide that they are no way liable to *fire*, as the *wooden Laths* are, they hold the *heat* ſo much better, that being once *heated*, a ſmall matter of *fire* will keep them ſo, which are valuable advantages in the *Profeſſion* of *Maulting*.

91. And which brings me to the *Arts* relating to *Stone*, they have lately alſo about *Burford*, made their *Mault kills* of *ſtone*; the firſt of them being contrived after an accident by *fire*, by *Valentine Strong*, an ingenious Maſon of *Teynton*, much after the manner of thoſe of *brick*, which for the benefit of other *Counties* where they are not known, I have cauſed to be delineated ſo far forth at leaſt, as may be direction enough to an ingenious *Work-man*, in *Tab.* 13. *Fig.* 1, 2. whereof the firſt *Figure* ſhews the *front* of ſuch a *Kill*, and the Letters

a. *The* Kill *hole.*
b. *The* Pillars *that ſupport the principal* Joiſts.
c. *The ſloping away of the inſide of the* Oaſt.
d. *The ends of the* Joiſts.
e. *The ſpaces between the* Joiſts *for the* Laths.

And the ſecond *Figure*, the ſquare above, immediatly ſupporting the *Oaſt-hair* and the *Mault*, wherein the Letters

f f. *ſhew the* Flame-ſtone.
g g. *The* Pillars *on which the principal* Joiſts *lie.*
h h. *The principal* Joiſts.
i i. *The ſhorter* Joiſts.
k k. *The* Laths *between the* Joiſts.
l l. *The ſpaces between the* Laths.

Which firſt *Kill* of *Valentine Strong*, built after this manner in *ſtone*, ſucceeded ſo well, that it hath ſince obtained in many other *places*; nor do I wonder at it, for beſide the great ſecurity from *fire*, to which the old *Kills* were very ſubject, theſe alſo dry the *mault* with much leſs *fuel*, and in a ſhorter time, than the old *ones* would do; inſomuch that I was told by one Mr. *Trindar*, an ingenious *Gentleman* of *Weſt-well*, who ſhewed me a fine one of his own at *Holwell*, that whereas he could formerly dry with the ordinary *Kill* but *two Quarters* in a day, he can now dry *ſix*, and with as little *fuel*. Now if *Mault-kills* or *Oaſts* made with ordi-

nary

nary *ſtone* prove ſo advantagious, what would one of them do, if the *Joiſts* and *Laths* at leaſt were made of the *Corniſh warming-ſtone*, that will hold *heat* well eight or ten hours? or of *Spaniſh Ruggiola*'s, which are broad *plates* like *tiles*, cut out of a Mountain of *red ſalt* near *Cardona*, which being well *heated* on both ſides, will keep warm 24 hours°?

92. To which may be added the *Invention* of making *Glaſſes* of *ſtones*, and ſome other *materials*, at *Henly* upon *Thames*, lately brought into *England* by *Seignior de Coſta* a *Montferratees*, and carryed on by one Mr. *Ravenſcroft*, who has a Patent for the ſole making *them*; and lately by one Mr. *Biſhop*. The *materials* they uſed formerly were the *blackeſt Flints* calcined, and a white *Chriſtalline* ſand, adding to each pound of *theſe*, as it was found by ſolution of their whole mixture, by the ingenious Dr. *Ludwell* Fellow of *Wadham College*, about two *ounces* of *Niter*, *Tartar*, and *Borax*.

93. But the *Glaſſes* made of *theſe* being ſubject to that unpardonable fault called *Crizelling*, cauſed by the two great quantities of the *Salts* in the *mixture*, which either by the adventitious *Niter* of the *Air* from without, or warm *liquors* put in them, would be either *increaſed* or *diſſolved*; and thereby indure a *Scabrities* or dull roughneſs, irrecoverably clouding the tranſparency of the *glaſs*; they have choſen rather ſince to make their *glaſſes* of a great ſort of white *Pebbles*, which as I am informed they have from the River *Po* in *Italy*; to which adding the aforementioned *ſalts*, but abating in the *proportions*, they now make a ſort of *Pebble glaſs*, which are hard, durable, and whiter than any from *Venice*, and will not *Crizel*, but endure the ſevereſt trials whatever, to be known from the *former* by a Seal ſet purpoſely on them.

94. And yet I gueſs that the difference, in reſpect of *Crizeling*, between the preſent *Glaſs* and the former, lies not ſo much in the *Calx*, the *Pebbles* being *Pyrites* (none but ſuch I preſume being fit for *vitrification*) as well as the *Flints*; but rather wholly in the *abatement* of the *ſalts*, for there are ſome of the *Flint glaſſes* ſtrictly ſo called (whereof I have one by me) that has endured all tryals as well as theſe *laſt*. But if it be found otherwiſe, that *white Pebbles* are really fitter for their turns than *black Flints*, I think

° See Mr. *Willughby*'s Voyage through *Spain*. *p.* 471.

they

they have little need to fetch them from *Italy*, there being enough in *England* of the ſame kind, not only to ſupply *this*, but perhaps *Foreign Nations*. Which is all concerning *Arts* relating to *ſtone* and *glaſs*; except it be alſo worth notice, that *Venerable Bede* of this *Univerſity*, firſt brought Building with *ſtone*, and *Glaſs windows* into *England*[p].

95. Whence according to my propoſed *method*, I proceed to the *Arts* relating to *Plants*; amongſt which, the firſt that preſent *themſelves*, are thoſe that concern the *Herbaceous* kind. Of this ſort we may reckon that ingenious *Experiment* made in *June*, 1669. by my worthy Friend *John Wills* M. A. and Fellow of *Trin. Coll. Oxon.* in order to find in what meaſure *Herbs* might *perſpire*, wherein he made uſe of the following *method*. He took two glaſs *Vials* with narrow necks, each holding one *pound* 8 *ounces*, and 2 *drachms* of water, *Avoir de pois* weight: into one of theſe *glaſſes* filled with *water*, he put a ſprig of floriſhing *Mint* (which before had grown in the *water*) weighing one *ounce*; the other *glaſs* he alſo fill'd with *water*, and expoſed them both in a *window* to the *Sun*. After ten days time, he found in the bottle where the *mint* was, only five *ounces* and four *drachms* of *water* remaining, and no more, ſo that there was one *pound* two *ounces* and ſix *drachms* ſpent, the *mint* weighing ſcarce two *drachms* more than at firſt.

96. From the other *Glaſs*, where *water* was put of the ſame *weight*, and no *mint*, he found the *Sun* had exhaled near one *ounce* of *water*, and therefore concluded it drew but ſo much out of the firſt *glaſs*, at leaſt not more: So that allowing one *ounce* for what the *Sun* had exhaled, there was in thoſe ten days ſpent by the *mint*, one *pound* one *ounce* ſix *drachms* of *water*; and the *mint* being increaſed in weight only two *drachms*, 'twas plain the *mint* had purely expired in thoſe ten days, one *pound* one *ounce* and four *drachms*, that is, each day above an *ounce* and *half*, which is more than the weight of the whole *mint*. Whence he concluded, that what *Malpighius* ſo wonders at in his Book *De Bombyce*, *viz. that thoſe* Animals *will ſomtimes eat in one day, more than the weight of their bodies*, is out-done by every *ſprig* of *mint*, and moſt other *Herbs* in the *Field*, which every *ſummers* day attract more nouriſhment than their own weight amounts too.

[p] *Vid. Comment. in Carmen Phaleucium Johan. Seldeni*, before *Hoptons* Concordance of years.

97. Which

97. Which the ſame ingenious *perſon* at leaſt queſtions not (and therefore wiſhes tryals may be made) of the *Tithymali*, *Eſulæ*, and eſpecially of *Pinguicula* and *Ros Solis*, which laſt ſucks up moiſture faſter than the *Sun* can exhale it, and is bedewed all over at *Noon-day*, notwithſtanding its power: Nor doubts *he* but that *Wormwood*, and all other *Plants* that are very hot, and of ſtrong ſmells, expire as much, if not more than *Mint*.

98. There are alſo ſeveral *Arts*, uſed about the *Corn* in this *County*, whil'ſt in the *blade*, and *ſtraw*, that belong to this place, ſuch as eating it off with *Sheep*, if too *rank*, to make it grow ſtrong and prevent lodging: whil'ſt the *Corn* is young they alſo weed it, cutting the *thiſtles* with a hook; but *rattles* they hand-weed as ſoon as in *flower*, and ſo they do *cockles* when they intend the *Corn* for *ſeed*. If the *Crows* toward *Harveſt* are any thing miſchievous, as they many times are, deſtroying the *Corn* in the outer limits of the *Fields*, they dig a *hole* narrow at the bottom, and broad at the top, in the *green ſwarth* near the *Corn*, wherein they put *duſt*, and *cinders* from the *Smiths* forge, mixt with a little *Gun-powder*, and in and about the *holes* ſtick *feathers* (*Crow-feathers* if they can get them) which they find about *Burford* to have good ſucceſs.

99. They cut their *Wheat* here rather a little before, than let it ſtand till it be over-ripe; for if it be cut but a little too ſoon, the *ſhock* will ripen it, and the *Corn* will be beautiful, whereas if it ſtand too long, much will ſhatter out of the head in *reaping*, eſpecially if the *wind* blow hard, and that the beſt *Corn* too; the worſt only remaining, which will be pale in the hand, an unpardonable fault where the *Baker* is the *Chapman*. In reaping *Wheat* and *Rye* they uſe not the *ſicle*, but a ſmooth edged *hook*, laying their *Corn* in ſmall hand-fulls all over the *Field*; I ſuppoſe that it may the ſooner dry, in caſe wet come before they *bind* it, which they do in very ſmall *ſheaves*, and very looſe in compariſon of ſome other *Counties*: They *ſhock* it rafter-wiſe, ten *ſheaves* in a *ſhock*, which if ſet wide in the but-end, will be very copped and ſharp at the top, and will bear out rain beyond hope, or almoſt credit.

100. They count their *Barly* ripe (as they do their *Wheat*) when it hangs the head and the *ſtraw* has loſt its *verdure*, which they mow with a *ſithe* without a *cradle*, never binding but raking it

it together, and cocking it with a *fork*, which is uſually a *trident*, whoſe teeth ſtand not in a row, but meet *pyramidally* in a *center* at the ſtaff: They let it lie in the *ſwathe* a day or two, which both ripens the *Corn* and withers the *weeds*. *Oats*, and all *mixed Corns* called *Horſe-meat*, are Harveſted ſomtimes with two reaping *hooks*, whereof the manner is thus: The *Work-man* taking a *hook* in each hand, cuts them with *that* in his right hand, and rolls them up the while with *that* in his left, which they call bagging of *Peas*: Others they cut with a reaping *hook* ſet in a *ſtaff* about a yard long, and then they cut and turn the *Peas* before them with both hands till they have a *wad*, which they lay by, and begin again; and this they call cutting with the *ſtaff-hook*: But the *ſithe* they ſay is much the ſpeedieſt way, which if uſed with care, cuts them as well and clean, as either of the other.

101. After the *ſithe* they *wad* both *Beans* and *Peas*, and ſo turn them till they are throughly withered and dry, and then *cock* and fit them for *carriage*, only with this difference, that *Beans* while they are *cocked* and *carryed*, have the looſe *ſtalks* pickt up by *hand*, the rake being apt to beat the *Beans* out of the *pods*, as they are drawn up againſt the leg. All ſorts of *Cocks* are beſt made of a middleing *cize*, and well top'd; the advantages are, that theſe are apprehended at leaſt to take leſs wet with the ſame *rain* than greater, and will dry again without breaking; whereas the great *cocks*, after *rain*, muſt be pulled to pieces, which cannot be done without great loſs, for in the opening and turning much *Corn* will be beaten out, and that certainly the beſt too.

102. If their *Corn* be brought home a little *moiſter*, or *greener* than ordinary, or the *weeds* be not let lie to be throughly ſhrunk or wither'd, that they ſuſpect it may *heat* in the *Barn* more than ordinary (for it is kind for *Corn* and *fodder* to *heat* a little) then they draw a *Cubb* or *Beer-lip* (which others call the *Seed-cord*) up the middle of the *mow* or *ſtack*, and through the *hole* that this leaves, the *heat* will aſcend and ſo prevent *mow-burning*; Or if it *heat* in the *Barn* beyond expectation, and be like to do amiſs, they then pull a *hole* in the middle from the top to the bottom, which will alſo help it much. They draw an old *Axel-tree* of a *Cart* up a *Hay-rick* to the ſame purpoſe, if they think their *Hay* of the *greeneſt*, or over *moiſt* when *ſtacked*.

103. But

103. But the beſt contrivance I ever yet ſaw to prevent the *firing* of *Ricks* of *Hay*, or *Sainct-foin*, I met with at *Tuſmore*, at the Worſhipful *Richard Fermors* Eſq; where they let in *ſquare pipes* made of *boards* of a foot *diagonal*, to the middle of their *ſtacks*, to give them *Air* perpetually; the number of *pipes* bearing proportion to the bigneſs of the *Ricks*, which no queſtion may alſo be as rationally applyed to *ſtacks* of *Corn*, whenever thought ſubject to the ſame danger.

104. To preſerve their *Ricks* of *Corn* lyable to *rats* and *mice*, they commonly place them in this *Country*, on *ſtanders* and *caps* of *ſtone*; the *ſtanders* being four *Obeliſcs* about two foot high, and the *caps* as many *Hemiſpherical ſtones* placed upon them, with the flat ſides downwards, on which having laid four ſtrong pieces of *Timber*, and other *Joiſts* to bear up the *Corn*, they place their *Ricks*, which then are not annoyed by *mice* or *rats* (at leaſt not ſo much) as *ſtacks* on the ground, by reaſon the *Hemiſpherical* ſtones being *planums* at the bottom, though they may poſſibly aſcend the *ſtanders* well enough, yet can ſcarce get up the *caps*, whoſe broad bottoms hang ſo over them *in plano Horizontis*, that they muſt needs fall in the attempt.

105. The *Cart* they moſt uſe to bring home their *Corn*, is the two-wheeled *long Cart*, having *ſhambles* over the *ſhafts* or *thills*, a *Cart Ladder* at the breech, and *hoops* over the *wheels*, on which they will lay great and very broad *loads*, though it go not ſo ſecure and ſteady as a *Waggon*, which notwithſtanding that advantage is of but little uſe here, only amongſt *Carriers*, *&c.* They uſe alſo a ſort of *Cart* they call a *Whip-lade*, or *Whip-cart*, whoſe hinder part is made up with *boards* after the manner of a *Dung-cart*, having alſo a head of *boards*, and *ſhambles* over the *thills*; which *head* being made ſo as to be taken out or left in, the *Cart* may be indifferently uſed to carry *dung* or other *matters*; *dung*, when the *head* is in, and *Corn*, *&c.* when taken out.

106. About *Banbury* moſt of their *Carts* have *Axel-trees* of *Iron*, made *ſquare* at one end and *round* at the other; at the *ſquare* end they are made faſt into one of the *wheels*, and move round together with it; and at the other end they move within the *box* of the *wheel*, and the *wheel* round them too: With this ſort of *Axel* ſome are of opinion that the *Cart* moves much lighter for the *Cattle*, than with a wooden *one*, to whom I ſhould much rather

aſſent, did the *round* end of the *Axel* move in a *box* of *braſs*, and were the places where the *Cart* reſts on it, lined with *braſs plates*, for then a ſmall matter of *oil* (as 'tis in the *oiling* of *bells*) would cauſe the heavieſt weight to be moved with great eaſe: however as they are, much leſs *greaſe* ſerves the turn; and one of them made of good tough *iron*, will laſt a mans *age*, and ſomtimes *two*, whereas the wooden *ones* are frequently at reparations: nor does there any inconveniency attend *them* that I could hear of, but that the *wheels* have not ſo much room to play to and fro on *theſe*, as on the *others* of *wood*, and therefore not ſo good where either the *ways* or *Cart-routs* are deep.

107. Their way in this *Country* to bring the *corn* from the *ſtraw*, is for the moſt part by the *flail*, only in ſome *places* when their *wheat* is very *ſmutty*, they have a way of *whipping* it firſt, and then *threſhing* it afterwards: their manner of *whipping* is ſtriking the *corn* by a handful at a time, againſt a *door* ſet on its edge; and when a *ſheaf* is thus *whipt*, they bind it up again for the *flail*: which way indeed is troubleſom and tedious, but by this means the *ſmut bags* or *balls* are preſerved unbroken, and by the ſtrength of a good wind, and care in the *raying*, moſt part of them may be gotten forth, and the *wheat* left clear.

108. But before they threſh *Rye*, they ſomtimes take care to preſerve ſome of the *ſtraw* whole or unbroken, to ſerve for *ſtraw-works*: which I ſhould not have thought worth mentioning, but that we have an *Artiſt* here in *Oxford*, the ingenious *Robert Wiſeman*, excellent for ſuch matters, beyond all compariſon; and yet *he* modeſtly owns, that *he* ſaw work in *Italy* that gave him a hint for his *Invention*, but knows not whether that *Artiſt* (but believes rather the contrary) uſes the ſame procedure that *he* does or no: However, if it muſt not be allowed his *Invention*, yet becauſe *he* has improved it to ſo great an *excellency*, I cannot but let the *World* know, that though he *profeſſes* nothing extraordinary in the *dying* of his *colours*, yet by certain *method*, of firſt ſcraping the *ſtraw*, and cutting it into ſmall ſquare *pieces*, none longer than the 20th or 30th part of an *inch*, *he* can lay them on *wood*, *copper* or *ſilver* (firſt prepared for the purpoſe) in ſuch order and manner, and that with great *expedition*, that thereby *he* repreſents the *ruins* of *Buildings*, *Proſpects* of *Cities*, *Churches*, *&c.* upon *dreſſing* or *writing Boxes*, or *Boxes* for any other uſe.

109. *He*

109. *He* alſo repreſents in a moſt exquiſite manner, both the *Iriſh* and *Bredth ſtitch* in *Carpets* and *Screens*, which he makes of this *ſtraw work* for the more curious *Ladies*; and with theſe he covers *Tobacco boxes*, or of any other kind, whether of *wood* or *metal*, puting the *Arms* of the *Nobility* and *Gentry*, if deſired, upon the *tops* or elſewhere: And all theſe with the *colours* ſo neatly *ſhaded* off, from one another, that at due diſtance they ſhow nothing *inferior* to *colours* laid with a *Penſil*. When theſe *Proſpects*, *&c.* are made, he can and does frequently waſh his *work* with common *water*, leting it continue at leaſt an *hour* underneath it; then drys it with a *ſponge*, and beats it with a wooden *mallet* as thin as may be, and then lays it on his *boxes*, giving it laſtly ſo curious a *poliſh*, that no *varniſhing* excels it: which *work*, though made of ſuch minute ſquares of *ſtraw*, will endure portage, and any other as ſevere uſage, as moſt other *materials*; none of them being to be gotten off by eaſie means, but will admit of *waſhing* and *poliſhing* again, when at any time foul, as well as at the firſt.

110. Which is all concerning *Corn*, whil'ſt in the *blade* or *ſtraw*, what remains relates to the ſeparating the *ſeed* from the *chaff*, and preſerving it in the *ſtores*. As to the firſt, they either do it in a good *wind* abroad, or with the *fan* at home, I mean the *leaved fan*; for the *knee fan*, and caſting the *corn* the length of the *Barn*, are not in uſe amongſt them. They that have but ſmall quantities, when no *wind* is ſtirring, will do it with a *ſheet*; the manner thus: Two *perſons* take a *ſheet*, and double it at the *ſeam*, then rolling in each end a little, and holding one hand at the top, and the other a foot or 18 inches lower, they ſtrike together and make a good *wind*, and ſome ſpeed. But the *wheel fan* ſaves a *mans* labor, makes a better *wind*, and does it with much more expedition.

111. They preſerve it in their *ſtores*, as well as *ricks*, from *mice* and *rats* by many *ordinary* means uſed in other places: but I met with one way ſomwhat *extraordinary*, performed by a peculiar ſort of *Rats-bane*, that kills no creatures but thoſe for which it is deſigned, except *poultry*; ſo that it is an excellent *remedy*, eſpecially within doors, where *Fowls* ſeldom come, or any other place where they may be kept from it; all *Cats*, *Dogs*, *&c.* taſting it without hurt. To ſecure their *Corn* from muſting, I have heard of ſome that have laid it in *Chambers* mixt with *Pebble-ſtones* of the

larger cize *ſtratum ſuper ſtratum*, *viz.* after every ſix inches thickneſs of *Corn*, a *ſtratum* of *Pebbles*, placed about a yard diſtance from each other, then *Corn* again to the ſame thickneſs, and ſo *S S S* to ten *lains* apiece: by which method, as I was told, *Corn* had been preſerved ſweet and free from *muſt*, ten years together, only removing it once a year, and laying it again as before; and in the *Summer* time when the weather was dry, ſetting open the *windows* in the day time and ſhutting them at night.

112. To recover it from *muſtineſs*, to its priſtin *ſweetneſs*, ſome have laid it out all *night*, thin ſpred on *cloaths*, to receive the Evening and Morning *dews*, with ſo good ſucceſs, that being dryed again next day in the Sun, the ill ſmell has been quite removed. And thus I have done with the moſt uncommon *Arts* I have met with concerning *Plants* related to *Husbandry*, and the whole *Herbaceous* kind: where by the way let it be noted, as in *Chap.* 6.§.23. that theſe *Arts* are called *uncommon*, not ſo much in reſpect of this, as of other *Counties*, where indeed they will ſeem ſo: and that I have written of them rather for the information of *ſtrangers*, than the *Inhabitants* of *Oxford-ſhire*, as I muſt hereafter in other *Counties*, for information of this. Wherein if through my own *ignorance*, or *frowardneſs* of ſome *Husbandmen* (I dare not ſay all) I have failed of that *accuracy*, that might otherwiſe have been expected, I beg the *Readers* pardon, and promiſe amendment in the following *Counties*, provided I have encouragement to go on in my deſign.

113. After the *Herbaceous Plants*, come we next to conſider the *Shrubs* and *Subfrutices*, amongſt which I met with one, perhaps I may ſay ſcarce heard of *curioſity*, though it have been an *Experiment* frequently performed many years ſince, not only by thoſe excellent *Gardeners* and *Botaniſts*, the two *Bobarts*, Father and Son; but as I have heard alſo by the Reverend and Ingenious *Robert Sharrock* LL D, and Fellow of *New College*, who after many unſucceſsful tryals of *grafting* one *Fruit* upon another, made at laſt a very pleaſant *one*, and to good *advantage* too, upon different *Vines*, which in ſo great meaſure anſwer'd their hopes, that they have now ſignal proof in the *Phyſick Garden* of the *white Frontiniac* grafted upon the *Parſly Vine*, growing and bearing very well; and to this *advantage*, that they think the early ripening ſtock of the *Parſly Vine*, to conduce ſomwhat to the earlyer

earlyer ripening of the *white Frontiniac*, naturally late.

114. They have alſo *grafted* the *early red-cluſter* or *Currant-grape*, upon that large, luxuriantly growing *Vine*, called the *Fox-grape*, which ſeems to produce much fairer and ſtronger *Fruit*, than that *grape* is uſually upon its own *ſtock*. And divers other *Experiments* of this *nature* they ſay may eaſily be made, as well to have *white* and *black*, or other *varieties*, as they have already *broad leav'd* and *narrow leav'd*, *early grapes* and *late ones*, on the ſame *ſtock*: But this is not to be done by preſent *amputation*, as in other *Fruits*, the wood being not ſufficiently ſolid to bear it.

115. As to the *Arts* relating to *Trees*, the chiefeſt are thoſe of the *Planter* and *Gardener* making curious *Walks*, and *Topiary works* of them; ſuch is the *Dial* cut in *Box* in *New College* Garden, the *Kings arms*, and the *College* coat of *arms* there, and at *Exeter College*; beſide the other Garden *knots* of *Box* in both thoſe *Colleges*, and in *Braſen-noſe College* Quadrangle; to which add the *Guards* at the *Phyſick garden* gate of *Gigantick* ſtature, and ſeveral other *Topia* in the ſame *Garden*, all formed of the *Yew tree*. Of *Walks*, the moſt curious I have met with in this County, are thoſe elegant ones of *Trees* of various kinds in *Cornbury Park*; and (to omit the numerous Walks in and about the *Univerſity*) thoſe of *Firs* at Sir *Peter Wentworths* at *Lillingſton Lovel*, and the pleaſant *Viſta* at Sir *Timothy Tyrrils*, from a ſhort walk of *Trees* toward the *Chiltern hills*; and for a *cloſe Walk* there is a fine one lately deſigned in *Grimes-ditch*, near *Ditchley*, a ſeat of the Right Honorable *Edward Henry* Earl of *Lichfield*'s, about half a mile in length.

116. For *Garden walks*, I think one of the longeſt I met with, was at the Worſhipful Mr. *Clerks* at *Aſton Rowant*. And for a deſcent, there are none like the Walks at *Rouſham*, in the Garden of the Worſhipful *Robert Dormer* Eſq; where there are no leſs than *five* one under another, leading from the *garden* above, down to the *river* ſide, having *ſteps* at each end, and parted with *hedges* of *Codlings*, *&c.* But of all that I ever met with, there is a Walk at the Worſhipful Mr. *Fermors* of *Tuſmore*, the moſt wonderfully pleaſant, not only in that it is placed in the middle of a *Fiſh-pond*, but ſo contrived, that ſtanding in the middle no Eye can perceive but it is perfectly *ſtreight*, whereas when removed to either end, it appears on the contrary ſo ſtrangely crooked, that the Eye does not reach much above half the way,

117. Which

117. Which deception of ſight moſt certainly ariſes from a *bow* in the middle, which ſeems only an *ornament*, and the *incapacity* of the *Beholder* of ſeeing both parts of the *Walk* at one time; which that it may be the better apprehended, ſee the manner of it, Tab. 13. Fig. 3. where the *letter a* ſhews the *walk* from the *garden* tending toward *that* in the *Fiſh-pond*, *b* the place of the *beholder*, *c* the *ſemicircle* or *bow* oppoſite to *him*, *d e* the two ends of the *walk*: Now the *beholder* being placed in *b*, and having the *bow* before *him*, is not commonly ſo wary as to find, that if the lines *f g h i* were continued, they would *decuſſate* and not fall into *ſtraight* lines, nor that the *walks* themſelves would do the ſame, becauſe *he* ſees but one *ſtraight* part of the *walk b d* at one time, and the other *b e* at another time, which when ſeen together at either end, plainly meet in an *angle*, and by reaſon of the ſide *hedges* terminate the ſight at little more than half way, at *k l*.

118. Hither alſo belong the *methods* whereby they order their *Woods* in this *County*, which if *Under-woods* in or near the *Forreſt* of *Whichwood*, they commonly fell not till *twenty years* growth; but in the *Chaſe* near by it, ſomtimes at ſeven or eight: dividing them into *Acres* and *Braids* (or bredths) every *Acre* containing forty *braids*, a *braid* being one *pole* long and four broad; into which they thus divide their *Woods* for the better ſale of them to the meaner ſort of people, ſome buying ten, others twenty, and ſome thirty *braids* or more.

119. In the *Chiltern Country* they fell their Under-wood *Copices* commonly at eight or nine *years* growth, but their *tall wood*, or *Copices* of which they make *tall ſhids*, *billet*, *&c.* at no certain time; nor fell they theſe *Woods* all together, but draw them as they call it, almoſt every *year* ſome, according as their *wood* comes to be of a fit ſcantling for *tall ſhid* or *billet*, cutting every *ſhid* of *tall wood* four foot long beſide the *kerf*, and the *billet* three foot four inches, according to the *Statutes* of the 7 of *Edw.* 6. 7. and the 43 of *Q. Eliz.* 14. which ought alſo according to the ſame *Statutes*, whether *round bodyed*, *half round*, or *quarter cleft*, to be of a certain number of *inches* about, according as named or marked of ſo many *Caſt*, as may be ſeen particularly in the *Statutes* at large. Which is all concerning *Arts* relating to *Plants*, except it ſhall be thought worthy notice, that they uſe *ropes* in this *Country*,

try, made of the bark of the *Tilia fœmina folio minore*, ſmall leav'd *Lime* or *Linden tree*, in ſome *Countrys* called *Baſt*; whence the *ropes* are alſo called *Baſten ropes*; but of theſe no more, the *Tree* neither growing, nor the *ropes* being made in this *County*, but only uſed here.

120. Of *Arts* relating to *Brutes*, I have met with none extraordinary concerning the *winged Kingdom*, but the new ſort of *boxes*, or *Colony hives* for *Bees*, firſt invented, I ſuppoſe, by the Right Reverend Father in God *John Wilkins*, late Lord Biſhop of *Cheſter*; notwithſtanding the pretenſions of *John Gedde* Gent. and his ſeven years experience: for I find one of *them* ſet up in *Wadham College* Garden (where it ſtill remains) when the ſaid accompliſh'd Biſhop was *Warden* there above twenty years ſince. For *Fiſh*, I was ſhewed the model of a *Net* contrived by the ingenious Sir *Anthony Cope*, that ſeemed likely to catch all found within ſuch a compaſs.

121. Relating to four footed Beaſts, the ingenious *Richard Fermor* of *Tuſmore* Eſq; ſhewed me a pretty *contrivance* to avoid the incumbrance of *Oat tubs* in *Stables*, eſpecially where they are any thing ſtreightned in their *room*, by letting the *Oats* down from a *loft* above, out of a *veſſel* like the *Hopper* of a *Mill*, whence they fall into a ſquare *pipe* let into the wall, of about four inches *diagonal*, which comes down into a *Cup-board* alſo ſet into the wall, but with its end ſo near the *bottom*, that there ſhall never be above a *gallon*, or other deſirable quantity in the *cup-board* at a time, which being taken away and given to the *Horſes*, another *gallon* preſently ſucceeds; ſo that in the lower part of the *Stable* where the *Horſes* ſtand, there is not one inch of room taken up for the whole proviſion of *Oats*: which contrivance has alſo this further convenience, that by this *motion* the *Oats* are kept conſtantly *ſweet* (the taking away one *gallon* moving the whole *maſs* above) which laid up any otherwiſe in great quantities grow frequently *muſty*.

122. The ſame ingenious *Gentleman* has alſo applyed the ſame *contrivance*, with ſome little alteration, to the feeding of his *Swine*, which have conſtantly their *meat* from ſuch a *veſſel* like the *hopper* of a *Mill* placed over the *Sty*, into which having put a certain quantity of *beans*, enough to fat ſo many *Hogs*, they continually deſcend to about half way down the *Sty* in a large ſquare *pipe*, which then divides it ſelf into ſix ſmaller *ones*, which terminate each

each of them in a ſmall *trough*, no bigger than juſt to admit the *noſe* of a *Hog*, and come all of them with their *ends* ſo near the *bottom*, that there is never above a handful of *beans* or ſo, in each *trough* at a time, which taken away by the *Hogs*, there follow ſo many handfulls again, but never more: ſo that having alſo drawn a ſmall *Rivulet* of water through the *ſty*, the daily trouble of *ſervants* waiting on them is not only ſaved (for they need never come near *them* till they know they are *fat*) but the *Hogs* themſelves are alſo made hereby uncapable of ſpoiling a *bean*, by trampling or piſſing amongſt them as in moſt other *ſties*, they never having above a handful at a time, and thoſe in a *trough* too ſmall to admit any ſuch means of *waſt*.

123. He has thoughts alſo of applying the ſame *contrivance* to the feeding of his *Hounds*; and has made *ſtalls* for *Oxen*, by *ſpars* of wood deſcending perpendicularly from the utmoſt *rim* of the *rack*, and nailing boards on them half way up before the *Oxen*, that they cannot ſpoil by trampling, or any other means, the leaſt *ſtraw* or *graſs*, all that go beſide their mouths falling ſtill within the boards nailed upon the *ſpars*, which when come to any quantity, is returned into the *rack* as ſweet and good, as when put there at firſt. Which being matters of *Architecture* relating to *Beaſts*, bring me next to treat,

124. Of *Arts* that reſpect *Mankind*, and firſt of *Architecture*, wherein we have many remarkable *Curioſities*, as well in the *Country* as *Univerſity*; ſome whereof are of an *inferior*, others of a more *Honorable* rank and quality. Of the firſt ſort are ſeveral *Mills* that I have met with in this *County*, ſcarce perhaps to be found elſwhere in *England*; ſuch is that at the ſame ingenious Mr. *Fermors* at *Tuſmore*, which with one *horſe* and *man* (who is carryed round as it were, in a *Coach-box* behind the *horſe*) performs at pleaſure theſe very many *offices*. Firſt, it grinds *Apples* the common way for *Cider*. And ſecondly *Wheat*, which it *ſifts* at the ſame time into four different fineneſſes. Thirdly *Oats*, which it cuts from the *husk*, and *winnows* from the *chaff*, making very good *Oat-meal*. And laſtly makes *Muſtard*, which indeed is a meer *curioſity*. And all theſe it performs ſeverally, or together, according as deſired.

125. At *Hanwell*, in the Park, there is alſo a *Mill* erected by the ingenious Sir *Anthony Cope*, of wonderful contrivance, wherewith that great *Virtuoſo* did not only grind the *Corn* for his Houſe,

but

but with the ſame motion turned a very large *Engine* for cutting the hardeſt ſtone, after the manner of *Lapidaries*; and another for boaring of *Guns*: and theſe, as in the *Mill* at *Tuſmore*, either ſeverally or all together, at pleaſure.

126. To theſe add the *Mills* for making *French Barly*, erected ſome years ſince upon the *river* near *Caverſham*, by one Mr. *Burnaby*, but are now carryed on by one Mr. *Nelthrop* of *London*, Merchant: They are four in number, and differ from other *Corn mills* chiefly in the following particulars. 1. In that they have always *double tackling*. 2. The *ſtones* not being the *Cologne*, but ordinary *white ſtones*; which thirdly, are both of them cut the *ſending way*: and fourthly, the upper *ſtone* or *runner*, hung about a hands breadth diſtant from the *lower* or *bed ſtone*, alſo called the *Legier*. They put in the *Corn*, about half a buſhel at a time, not at the *eye*, but round the *hoops* at the ſides of the *ſtones*; they ſtop the *ſpout* or *tunnel*, and let the *Mill* run juſt an hour, for if the *Corn* ſtay longer the *heat* will turn it *yellow*: then they let it out, and ſever the *bran* and *flower* from the *Corn*, and put it up again into another *mill* of the ſame kind, and let it run in the ſame manner another hour, and the *work* is finiſhed.

127. Hither alſo muſt be referred the *Mault Kills* of *Henly*, ſo thriftily contrived, that the *Kill holes* are placed in the backs of their *Kitchin Chimneys*, ſo that drying their *mault* with wood, the ſame *fire* ſerves for *that*, and all the other uſes of their *Kitchins* beſide. To this place alſo belongs a ſort of *Oaſt* made about thirty years ſince by one *Philips* a Baker of *Magdalen Pariſh Oxon*, who having a very great *Oven*, made it plain at the top and plaiſter'd it over, whereon laying *mault*, he dryed it with the ſame *fire* that heated his *Oven* for the bread, and thus made the beſt *mault* that *Oxford* afforded, and of neceſſity the cheapeſt, for the *fire* coſt him nothing. I have heard alſo of the ſame *method* uſed at *Henly* on the *Thames*; and theſe, as ſome have ventured to aſſert, gave the firſt hints to the *Invention* of that ſort of *Kills* whereby they dry *mault* with *coal*; but herein I dare not be too confident, not knowing of what ſtanding thoſe *Kills* are, otherwiſe the thing ſeems to be likely enough.

128. Thus having run through thoſe of *inferior* rank, I come next to the remarkable *curioſities* of *Architecture* in our moſt *ſtately buildings*, and that have a more immediate relation to *mankind*

than any before mentioned, whereof ſome are *private*, others *publick*; and may both be conſidered either in the *whole* or *parts*. Of *private buildings*, the moſt eminent in this County, are the *Seats* of the Right Honorable the Earl of *Angleſey*, Lord Privy Seal, at *Blechington*, the Earl of *Clarendon* at *Cornbury*, the Earl of *Lichfield* at *Ditchley*, the Earl of *Rocheſter* at *Adderbury*, the Counteſs of *Down* at *Wroxton*, the Lord Viſcount *Say* and *Seal* at *Broughton*, the Lord Viſcount *Falkland* at *Great Tew*, the Lady *Abergavenny* at *Sherbourn*, the Lord *Norreys* (His Majeſties Lord Lieutenant of *Oxford-ſhire*) at *Ricot*, the Lord *Carrington* at *Ledwel*, and of the Honorable *James Herbert* Eſq; at *Tythrop* in *Oxford-ſhire*, though of *Kingsey* Pariſh in the County of *Buckingham*.

129. Whereunto might be added ſeveral *Structures* of the *minor Nobility*, that ſhew a great deal either of paſt or preſent Magnificence, ſuch as that of the Right Worſhipful Sir *Anthony Cope* late of *Hanwell*, of Sir *John Cope* at *Bruern Abbey*, Sir *Tho. Spencer* at *Yarnton*, Sir *Tho. Chamberleyn* at *Northbrook*, Sir *Francis Wenman* at *Thame-Park* and *Caſwel*, Sir *Tho. Cobb* at *Adderbury*, Sir *Anthony Craven* at *Caverſham*, Sir *William Glyn* at *Amerſden*, Sir *Robert Jenkinſon* at *Walcot*, Sir *William Walter* at *Sareſden*, Sir *Thomas Penyſton* at *Cornwel*, Sir *Compton Read* at *Shipton* under *Whichwood*, Sir *John D'Oyly* at *Chiſlehampton*, Sir *Edward Norreys* at *Weſton* on the *green*, Sir *George Croke* at *Waterſtoke*, Sir *Philip Harcourt* at *Stanton Harcourt*. And of the worſhipful *Tho. Stonor* at *Watlington Park* and *Stonor*, Eſq; *Robert Dormer* at *Rouſham*, Eſq; *Richard Fermor* at *Tuſmore* and *Sommerton*, Eſq; *John Stone* at *Brightwel*, Eſq; *John Clerk* at *Aſton Rowant*, Eſq; *Tho. Hoard* at *Coat*, Eſq; *Arthur Jones* at *Chaſleton*, Eſq; *Baſil Brook* at *North-Aſton*, Eſq; and the *ſeats* of the Families of *Knolles* at *Rotherfield Grays*, and *Blount* at *Maple-Durham*, Eſqs; To which add the *Parſonage* Houſe of the Rectory of *Chinner*, little inferior to ſome of the aforementioned, either in *greatneſs*, *commodiouſneſs*, or *elegancy* of Building.

130. And yet amongſt all theſe eminent private *Structures*, could I find nothing extraordinary in the *whole*: But in the *parts*, the *Kitchin* of the Right Worſhipful Sir *Philip Harcourt* Knight, of *Stanton Harcourt*, is ſo ſtrangely unuſual, that by way of *Riddle* one may truly call it, either a *Kitchin* within a *Chimney*, or a *Kitchin* without one; for below it is nothing but a large *ſquare*, and

and *octangular* above aſcending like a *Tower*, the *fires* being made againſt the *walls*, and the *ſmoak* climbing up them, without any *tunnels* or diſturbance to the *Cooks*; which being ſtopped by a large *conical* roof at the top, goes out at *loop-holes* on every ſide according as the *wind* ſits; the *loop-holes* at the ſide next the *wind* being ſhut with falling doors, and the adverſe ſide opened.

131. The ſpacious *Stair-caſe* at *Blechington*-houſe is alſo remarkable, not only for that it ſtands on an *Area* of 30 foot ſquare, but for its rarity too, it being not perhaps at all, at leaſt not eaſie to be met with amongſt the writers of *Architecture*: wherefore, though I cannot approve of its *contrivance* in all particulars, yet for the ſake of its *magnificence*, and *variety* from moſt, if not all *others*, I cannot in juſtice but afford it a ſhort deſcription.

132. It being placed therefore backward, oppoſite to the moſt honorable *entrance* of the Houſe, between two *wings* that extend themſelves beyond it, and the groſs of the *Pile*, you enter upon it having paſt by the *hall*, and other *offices* uſually placed by it, at the *door-way* A, *Tab.* 13. *Fig.* 4. and land upon the *half pace* 1, which together with the *reſt* marked 2 3 4, *&c.* are 6 foot $\frac{1}{3}$ ſquare: The *figures* in their natural order ſhew how you aſcend from one *half pace* to another, by *aſcents* of 7 ſteps, each about 5 inches $\frac{1}{2}$ deep, and near 10 inches $\frac{3}{4}$ broad: The *half paces* marked with the ſame *figure* lye on the ſame *level*, and therefore as 4 is the higheſt *half pace* in this firſt *Scheme* of it, ſo it is the loweſt in the ſecond, *Tab.* 13. *Fig.* 5.

133. In which alſo the order of the *figures* ſhews the manner of *aſcent* juſt as in the former, only it muſt be obſerved, that as the *aſcent* to the *half pace* 4 in the firſt *Scheme*, was ſuppoſe from *Eaſt* and *Weſt*, ſo the *aſcent* higher from it in the ſecond, is to *North* and *South*: Of which two *Schemes* placed alternatly over one another, the whole *ſtair-caſe* is framed from bottom to top, which is eaſily apprehended, if you but imagine the *half pace* 4 in the ſecond *Scheme*, to be placed over 4 in the firſt, and ſuch another *frame* as is delineated in the firſt *Scheme* to be placed on the ſecond: The *Letters V V* ſhew the vacancies that open a *Proſpect* from the top to the bottom of the whole *ſtair-caſe*, and *a b c d* ſhew the places of the *doors* into the *rooms* at each corner of it.

134. In ſhort, this *ſtair-caſe* ſeems to be a compoſition of 4 half-pace-open-newel'd *ſtair-caſes*, as may eaſily be perceived by the *figures*, 123, 123, 123, 123, and 567, 567, 567, 567, only communicating in the middle; which indeed ſhews very magnificently, but has this inconvenience, that there is no paſſage from one *room* into *another* though on the ſame *floor*, without going up and down many ſteps; as in *Scheme* the ſecond, if from *a* to *b*, and ſo of the *rooms* of any of the other ſides, you have no *paſſage* but from 6 to 7, and ſo down again to 6, *i. e.* 14 ſteps. But if you are to go from corner to corner, as ſuppoſe from *a* to *c*, or *b* to *d*, *& vice verſa*, whether you paſs round the ſides, or over the middle *half pace*, you cannot do it, without aſcending and deſcending in all twenty eight ſteps.

135. Of publick Buildings, the moſt eminent in the *County* are certainly thoſe of the *Colleges* and *Halls*, the *Publick Schools*, *Library* and *Theater* in the *Univerſity* of *Oxford*; of which yet in the whole I ſhall give no account, their magnificence and outward *Architecture* being already ſufficiently ſhewn, by the exquiſite hand of Mr. *David Loggan*, *Chalcographer* to the *Univerſity*, in his *Cuts* of them all lately ſet forth. It ſhall ſuffice me therefore to give a ſuccinct account of ſome particular parts of them, whether in the *ſtone* or *Timber-work*, ſcarce to be met with elſewhere, or known to few.

136. Of the firſt ſort is the *flat floor* of *ſtone* over the paſſage between the Right Reverend the *Provoſts* Lodgings, and the *Chappel* at *Queens College*, born up only by the ſide *walls* without any *pillar*, though conſiſting of divers *ſtones* not reaching the *walls*, which yet indeed may very well be, ſince as I am informed by the ſame Right Reverend *Provoſt*, and *Biſhop* of *Lincoln*, who pulled up the boards of the *room* above to view the *curioſity*; the *ſtones* are all *cuneoform*, and laid like that they call *ſtraight Arch-work*.

137. The Roof of *Merton College Treaſury* is alſo an odd piece of *ſtone-work*, being all made of *Aſhler*, yet ſlooping to an *angle* (only more acute than uſual) like *roofs* made of *Timber*: It has, 'tis true within, three inequidiſtant arched *ribs* of *ſtone* that ſeem to ſupport the *Fabrick*, which is about 20 foot long, but the *ſtones* not reaching from *rib* to *rib*, and ſeeming to be laid like common *pavement* both within and without, make many to wonder that it does not fall in: but the *ſtones* being pretty thick, and cut as they call

call it, with an *arching joint*, must necessarily lye as firm (and for the very same reason) as those at *Queens College* do, and so most certainly they would, were the *arches* quite removed. There is also much such another *roof* over a little *Oratory* or *Chappel* in the *Church* of *North Leigh* in this *County*.

138. As for arched *roofs* of *stone*, that of the *Divinity School* is a fine piece of *Architecture*; and so is that of the stately *Stair-case* leading into *Christ-Church* great *hall*. The *Physick garden* gate is a curious piece of *rustick rock-work*; and the *Portch* at *St. Maries*, the *University Church*, is a well contrived thing. And were it not improper amongst these to mention a *structure* of so inferior a quality, as *New College* house of *Easement*, commonly called the *long-house*, I could not but note it as a stupendious piece of *building*, it being so large and deep, that it has never been emptyed since the foundation of the *College*, which was above 300 years since, nor is it ever like to want it.

139. The *Portico*'s on the *East* and *West* sides of the *New Quadrangle* at St. *Johns College*, built by the most Reverend Father in God, *William Laud* Arch-Bishop of *Canterbury*, supported with *pillars* of *Blechington* Marble, are well worthy notice; and so is the Cloyster at *Magdalen College*, the Buttereſſes without being curiously adorned with *Hieroglyphical Imagery*.

140. The erect Southern declining *Dial* over *All Souls College* Chappel, is a neat piece of work, so curiously contrived by Sir *Christopher Wren*, that though it stand high, yet by the help of two *half rays*, and one *whole one* for every *hour*, one may see to a *minute* what it is a *clock*, the *minutes* being depicted on the sides of the *rays*, *viz.* 15 on each side, and divided into *fives* by a different *character* from the rest.

141. The *Cylindrical Dyal* in *Corpus Christi College Quadrangle*, set at right *angles* with the *Horizon* (the common *sections* whereof, with the *hour circles* (except the *Meridian circle* which divides it by the *axis*) as also the *Æquinoctial*, are all *Ellipses*) is a fine old piece of *Gnomonicks*; of which no more, because its Contriver Mr. *Robert Heggs*, Fellow of the *College*, has already written of it[q]. And the *Dials* made upon a pile of *Books* on *New College Mount*, with *Time* on the top, exactly pointing out from what *Quarter* the wind blows, upon the 32 Points of the *Compass*, depicted on

[q] *Tract. de Horologiis, Lib.* 4. *cap.* 4. MS. *in Biblioth.* C.C.C.

a *Cylinder* of *ſtone*, is an ingenious contrivance.

142. There are many lofty *ſpires* about the *Country* as well as *City*, built all of *Free-ſtone*, and of exquiſite workmanſhip, ſuch as thoſe of *Bampton*, *Witney*, *Burford*, *Bloxham*, *Spelsbury*, *Kidlington*, *&c.* but that which excels all the reſt is the *ſpire* of St. *Mary*'s in *Oxford*, the *Univerſity* Church, the Battlements whereof were repaired, and thus thick ſet with *Pinnacles* as it now ſtands, by Dr. *King* Dean of *Chriſt Church*, then *Vice-Chancellor* of the *Univerſity*, afterwards Biſhop of *London*.

143. For Towers, that of *Merton College* is a large well built thing; and ſo is that of the *Schools*, but more remarkable, for that it is adorned on the inner ſide next the *Quadrangle*, with all the *orders* of *Pillars*. But for a neat plain piece of work, that of *Magdalen College* excells all I have yet ſeen, adorned on the top with well proportion'd *Pinnacles*, and within with a moſt tunable ſweet ring of *bells*.

Miraris Turrim egregiam ſacro Ære ſonantem.

144. Amongſt *curioſities* in *Timber-work*, we may reckon ſeveral *ſcreens* in *College Chappels*; ſuch as that of *Magdalen College*, that of *Cedar* at *Lincoln College*, and another at *Corpus Chriſti* now erecting. There is an *Altar rail* at *All Souls College* of curious workmanſhip, and to this place belongs the *Tomb* of St. *Frideſwide*, ſtill remaining at *Chriſt Church*, the top whereof is *wood*, and a fine old piece of work: But not comparable to the Tomb of *fair Roſamund* at *Godſtow*, in the Chapter-houſe of the *Nuns* there, which according to the deſcription of *Ranulph Higden* ſeems to have been alſo of *wood*, and of wonderful contrivance, *ciſta ejuſdem puellæ* (ſays he, having ſpoken before of her *death* and *Epitaph*, and of the *Amour's* between *her* and K. *Henry* the ſecond) *vix bipedalis menſuræ, ſed mirabilis architecturæ ibidem cernitur, &c*[r]. *i. e.* That her *cheſt coffin* or *tomb* was there to be ſeen, not above two foot *long*, or perhaps rather *ſquare*, but a ſtupendous piece of workmanſhip, *in qua* (ſays the ſame Author at the ſame place) *conflictus Pugilum, geſtus animalium, volatus avium, ſaltus piſcium abſque hominis impulſu conſpiciuntur*, *i. e.* where in might be ſeen the *conflicts* of *champions*, the *geſtures* of *animals*, the *flights* of *birds*, with *fiſhes* leaping, and all done without the aſſiſtance of *man*.

[r] *Ranulphi Higden Polychron. Lib. 7. in Hen. 2. MS. fol. in Bib. Bod.*

145. By

145. By what means this was effected, we are not informed by the afore-cited Author, but the Learned *Thomas Allen* M. A. of *Gloceſter-hall*, thought it might be done by a ſort of *Looking-glaſs*, whoſe ſtructure he found mentioned in an ancient MS, *De Arcanis & Secretis*, with this Title, *Speculum in quo uno viſu apparebunt multæ imagines moventes ſe.* To be made thus, *accipe pixidem bene profundam, & pone in fundo ejus ſpeculum commune, ſc. convexum, poſtea, &c.* Take, ſays the Author, a deep *box*, and place in the bottom of it a common *convex glaſs*, then take 6 or 7 other *convex glaſſes* of the ſame bigneſs, and ſcrape off the *lead* [*plumbum* is the word] in the *concave* part with a knife; where by the way the Author adviſes, that ſince it is very hard to get the *lead* clean off without breaking the *glaſs*, that *Quick-ſilver* be made uſe of, to anoint the *lead* to get it off.

146. Theſe *glaſſes* when made *clean*, he orders to be put into the *box*, ſo as they may ſtand *obliquely* in divers poſitions, in this manner: When the firſt *glaſs* is put in the bottom, the ſecond muſt be ſo put, that one ſide of it muſt touch the firſt *glaſs*, and the oppoſite ſide be diſtant from *it* an inch, *& ſic* (ſays he) *oblique pones in pixide.* In the top there muſt be put one cleanſed *glaſs* as the firſt, *plain* and not *obliquely*, ſo that nothing muſt be ſeen but the uppermoſt *glaſs*, into which if you look, you ſhall ſee as many *Images* as *glaſſes*; and if turned round, how one *Image* always ſtands ſtill in the middle, and the reſt run round it, as if they went about to dance. Of which *contrivance*, though I underſtand not ſome particulars, yet I thought fit to mention them, becauſe they may poſſibly meet with a *Reader* that may, and tranſlate them too as well as I could, for the benefit of them all. As for thoſe that have opportunity, and are deſirous of ſeeing the *Latin* Copy, they may find it in a *Miſcellaneous* MS. in Mr. *Seldens* Library[s]. For my part, all that I can add concerning it, is, that I have ſeen a ſort of *Cabinets* of this nature, that by the help of *glaſſes* placed *obliquely* have ſhewn ſuch prety *proſpects*.

147. The great *bivalve wooden windows* in the upper Gallery of the *Theater*, are ſo ingeniouſly contrived, that notwithſtanding their great *weight*, yet can never ſink ſo as to be brought out of *ſquare*, as 'tis uſual in ſuch *windows*, for the *Iron* bars croſſing them from ſide to ſide, not being ſet at right *angles*, but *diagonally* like

[s] 4° *MS.* 79. *in Biblioth. Selden.*

ſtruts

ſtruts or *braces*, as in *Tab.* 13. *Fig.* 6. muſt neceſſarily bend or break before the *window* can ſink. Nor are the *round windows* below unworthy conſideration, being contrived to admit *air* in foul weather, yet not one drop of *rain*; for being opened and ſet *obliquely*, as in *Tab.* 18. *Fig.* 7. it receives the *rain* within at *a*, and caſts it out again at *b*; much leſs will it admit *rain* any ways when *ſhut*, it cloſing within its *frame* at the top, and without it at the bottom.

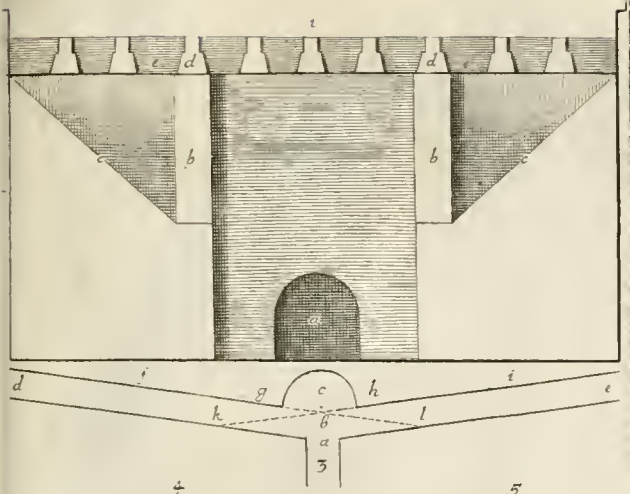
148. It was an excellent *device*, who ever firſt contrived it, of making *flat floors* or *roofs* of ſhort pieces of *Timber*, continued to a great bredth without either *Arch-work* or *Pillar* to ſupport them, being ſuſtained only by the *ſide walls* and their own *texture*; for by this means many times the defect of long *timber*, or miſtakes of *Work-men*, are ſupplyed and rectified without any prejudice to the *Building*. Of this ſort of work we have an example in the *Schools*, in the *floor* of the uppermoſt *room* of the *Tower*, but to be ſeen only in the *room* underneath where the *Records* of the *Univerſity* lye. There is alſo a *diagram* of ſuch work in the *Architecture* ſet forth by *Sebaſtian Serly* [t], for which reaſon I think I ſhould ſcarce have mention'd it, but that the Reverend and Learned Dr. *John Wallis*, *Savilian* Profeſſor of *Geometry* here, was the firſt that demonſtrated the reaſon of this *work*, and has given divers forms of it beſide the fore-mentioned, in his Book *De Motu*, whence I have taken the *diagrams*, *Tab.* 13. *Fig.* 8,9,10, 11, 12 [u]. to make them more publick; upon the two *firſt* whereof depend the three *laſt*, and all others of the kind what ever, whether made up of *quadrats* or oblong *parallelograms*, of which there are ſome other *forms* in the fore-cited Book *De Motu*, beſide that engraven *Fig.* 10. conſiſting of great and ſmall *Quadrats*; or *Triangles* alone, as *Fig.* 11. or mixt with *Hexagons*, as *Fig.* 12. to which Book I recommend the *Reader* for further ſatisfaction concerning them.

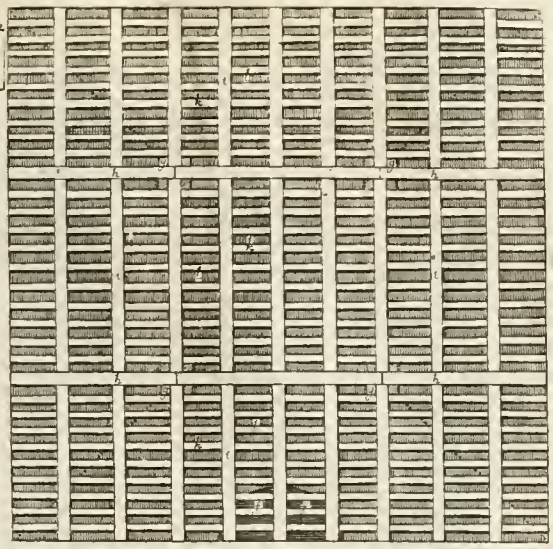
149. But of all the *flat floors* having no *Pillars* to ſupport it, and whoſe *main beams* are made of divers pieces of *Timber*, the moſt admirable is that of the *Theater* in *Oxford*, from ſide wall to ſide wall 80 foot over one way, and 70 the other, whoſe *Lockages* being ſo quite different from *any* before mentioned, and in many other *particulars* perhaps not to be parallel'd in the *World*, I have taken care to repreſent an exact draught of it, *Tab.* 14. *Fig.* 1.

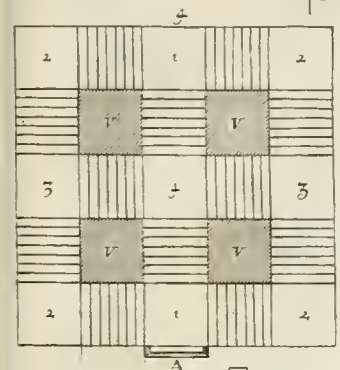
[t] *Seb. Serlii Architect Lib.* 1. *de Geom. cap.* 1. [u] *Walliſii Mechanica ſive de Motu, Parte* 3. *de vecte cap.* 6. *prop.* 10.

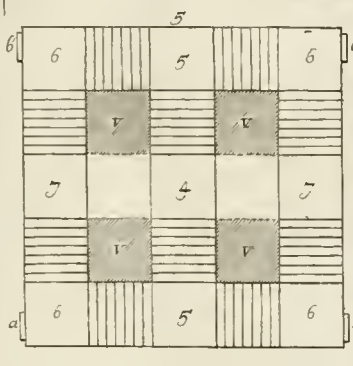
150. Where-

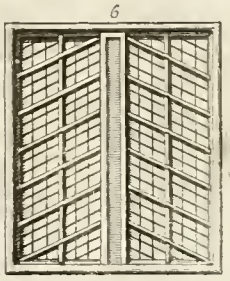
TAB. 13. ad pag: 272.

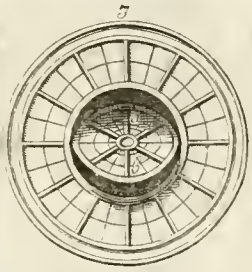


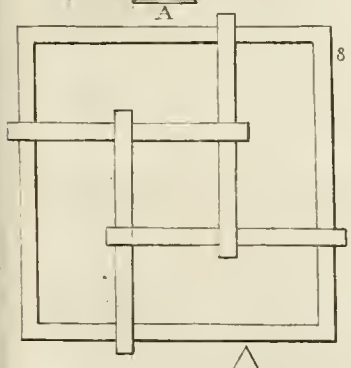


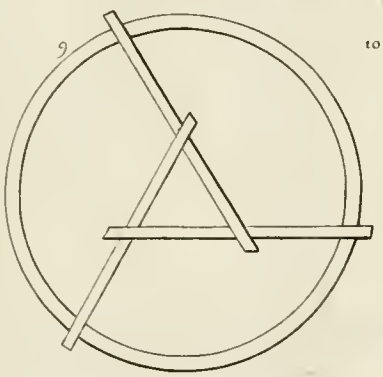


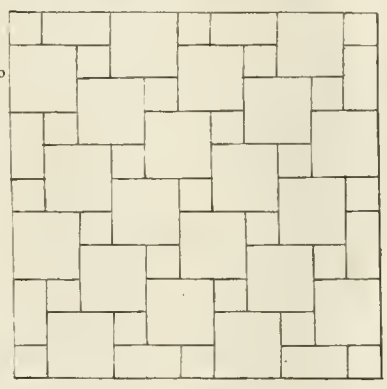


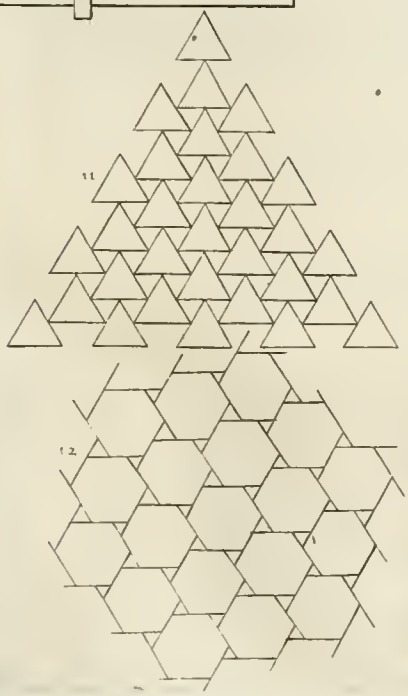








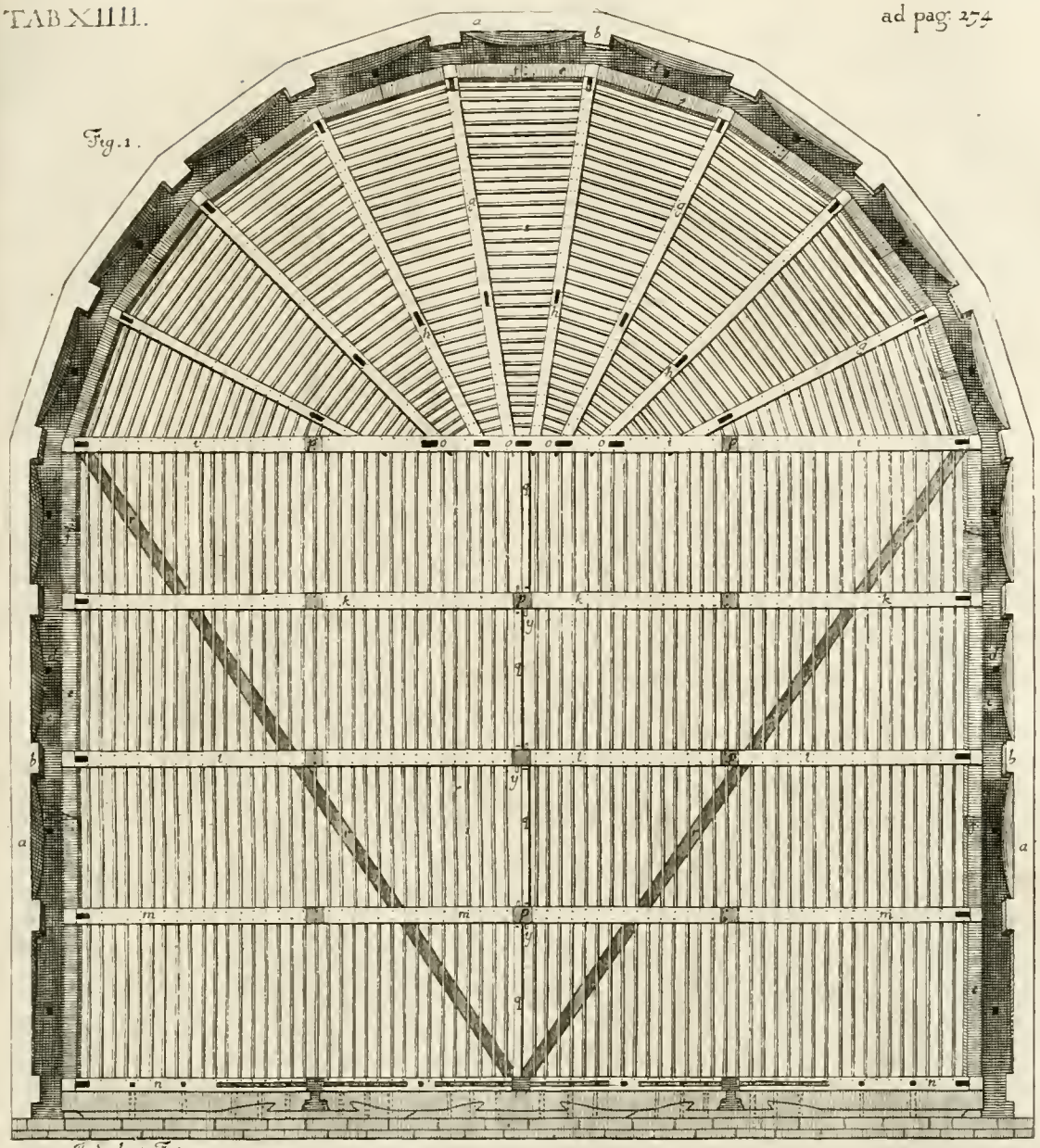




TAB XIIII.

ad pag: 274

Fig. 1.



A Scale of Feet.

5 10 15 20 25 30

Fig. 2

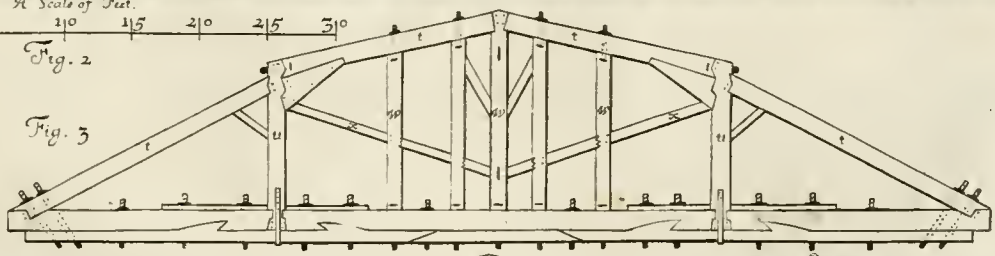


Fig. 3

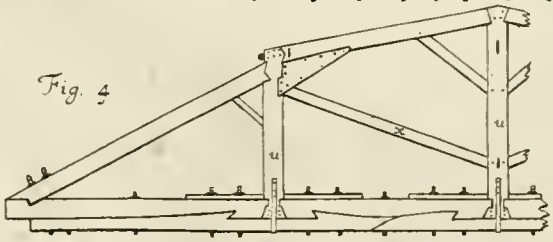


Fig. 4

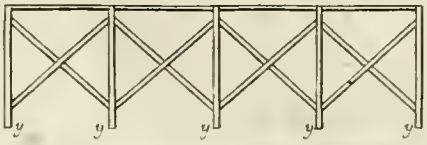


Fig. 5.

Burghers sculp.

To the right Worsp.ll
S.r FRANCIS WENTMAN K.t & Bar.t
K.t of the SHIRE in the p.sent Parliam.t
This 14 Table
Shewing the Timberwork of the THEATER with
all due respect is humbly dedicated
by R. P. L. L. D.

150. Wherein *a a a* and *b b b* ſhew the *walls* of the *Theater* that ſupport this *frame* of *timber*, and the places of the *pilaſters* of the *rail* and *balliſter* round it; *c c c* and *d d d* the *leads* and *pipes* let down into the wall for conveyance of *water*; *e e e* and *f f f* the *wall plate* or *lintel*, and places of its joints; *g g g* the *girders* of the *ſemi circle*, each ſupported by a *King piece* or *Crown poſt* cut off at *h h h*, and ſcrewed into the *binding beam i i i*; which is ſomwhat different from the reſt of the *binding beams k k k*, *l l l*, *m m m*, *n n n*, having ſeveral *prick-poſts* let into it at *o o o o*, beſide the *King-poſts* that ſupport this and the reſt at *p p p p p*, *&c.* The Letters *q q q* ſhew the *purlines* between the *binding beams*, not ſet right againſt one another becauſe of room to turn the *ſcrews* whereby they are faſtened, and *r r r r* two *dragon* (perhaps rather *Trigon*) *beams* or *braces* lying under the *joiſts ss ss ss*, *&c.* the true *lengths* and *diſtances* whereof, and of all other pieces of *timber* and *places* whatever, are all ſhewn by the *ſcale Fig.* 2.

151. And ſo are the *lengths* and *diſtances* of the ſeveral pieces of *timber* ſet over this *flat floor*, ſuch as the *principal rafters t t t t*, the *Crown poſts* or *King pieces u u u u*, the *prick poſts w w w*, *braces* or *punchons x x x*, by all which together the *binding beams*, *girders*, *joiſts*, *&c.* are all held up as it were by an *Arch* above, as in *Tab.* 14. *Fig.* 3. which is the whole *band* of *Timber* that ſtands next the *ſemi circle*, having *prick poſts* and different *lockages* from the reſt of the *four bands*, as is ſufficiently repreſented by one *half* of *one* of them, *Tab.* 14. *Fig.* 4.

152. Which is all I think need be ſaid concerning this fine piece of *Timber-work*, only that there are *croſs braces* between the middle *Crown poſts* as they ſtand in a line from the *front* to the *ſemicircle*, as is repreſented *Tab.* 14. *Fig.* 5. mark'd with the letters *y y y y y y* both here, and as they ſtand *Fig.* 1. And that it was contrived by our Engliſh *Vitruvius*, the Right Worſhipful and Learned Sir *Chriſtopher Wren*, and worked by *Richard Frogley* an able *Carpenter*; and both *this*, and the *ſtone-work* too, at the ſole charge of the moſt Reverend Father in God *Gilbert*, by Divine Providence, Lord Arch-Biſhop of *Canterbury*, Primat of all *England*, and Metropolitan, who finiſhing, and having endowed *it* with a competent *Eſtate* for its reparations for ever, It is like to ſtand a moſt magnificent and laſting *monument* of his *Graces* Munificence, and favor of good *Learning* to all poſterity.

153. There are ſeveral other *roofs* in this *Univerſity* alſo well worth the noting, whereof ſome are *flat* or *under-pitched*, as the *roof* of the great *Hall* at *Chriſt Church College*, and the *roofs* of the *Chappels* and *Halls* at *Magdalen College* and *New College*; others *due proportion'd*, or *over-pitched*, ſuch as at *Jeſus*, *Wadham*, *Corpus Chriſti*, *Exeter*, and *Oriel Colleges*; which yet having nothing extraordinary either in their contrivance or workmanſhip, I paſs them by, and proceed next,

154. To ſome remarkable pieces of *Painting* that we have here at *Oxon*; amongſt which (to omit the *deformation* of a *Cæſars* head to be ſeen in the *Schools*, brought into ſhape by a *metalline Cylinder*, and ſeveral others of the kind at Sir *Anthony Copes*; and that *Painting* it ſelf was firſt brought into *England* by *Venerable Bede* of this *Univerſity*[w]) I take the *Painting* of the *Theater* to be well worth examination: for in imitation of the *Theaters* of the ancient *Greeks* and *Romans*, which were too large to be covered with *lead* or *tile*, ſo this by the *Painting* of the *flat roof* within, is repreſented open: and as they ſtretched a *cordage* from *Pilaſter* to *Pilaſter*, upon which they ſtrained a covering of cloth, to protect the *people* from the injuries of the weather, ſo here is a *cord-molding* guilded, that reaches croſs and croſs the *houſe* both in length and bredth, which ſupporteth a great reddiſh *Drapery*, ſuppoſed to have covered the *roof*, but now furl'd up by the *Genii* round about the Houſe toward the walls, which diſcovereth the open *Air*, and maketh way for the deſcent of the *Arts* and *Sciences*, that are congregated in a circle of clouds, to whoſe *aſſembly Truth* deſcends, as being ſollicited, and implored by them all.

155. For joy of this *Feſtival* ſome other *Genii* ſport about the Clouds, with their *Feſtoons* of *Flowers* and *Lawrels*, and prepare their *garlands* of *Lawrels* and *Roſes*, *viz.* *Honor* and *Pleaſure* for the great *lovers* and *ſtudents* of thoſe *Arts*: and that this *aſſembly* might be perfectly happy, their great *enemies* and diſturbers, *Envy*, *Rapin*, and *Brutality*, are by the *Genii* of their oppoſite *Virtues*, *viz.* *Prudence*, *Fortitude*, and *Eloquence*, driven from the *ſociety*, and thrown down head-long from the Clouds: The report of the *aſſembly* of the one, and the expulſion of the other, being proclaimed through the open and ſerene *Air*, by ſome other of the *Genii*, who blowing their *antick* Trumpets, divide themſelves into the ſeveral *Quarters* of the World. Hitherto in groſs.

[w] *Vid. Comment. in Carmen Phaleucium, Joh. Seldeni*, before *Hoptons* Concordance of Years.

156. More

156. More particularly the *circle* of *Figures* conſiſts firſt of *Theology*, with her Book with *ſeven ſeals*, imploring the aſſiſtance of *Truth* for the unfolding of it. On her left hand is the *Moſaical Law* vailed, with the Tables of ſtone, to which ſhe points with her *Iron rod*. On her right hand is the *Goſpel*, with the *Croſs* in one hand, and a *Chalice* in the other, In the ſame diviſion over the *Moſaical Law* is *Hiſtory*, holding up her *Pen* as dedicating it to *Truth*, and an attending *Genius* with ſeveral *fragments* of old Writing, from which ſhe collects her *Hiſtory* into her Book: On the other ſide, near the *Goſpel*, is *Divine Poeſy* with her *Harp* of *Davids* faſhion.

157. In the *triangle* on the right hand of the *Goſpel*, is alſo *Logick* in a poſture of *arguing*; and in *another* on the left hand of the *Moſaical Law*, is *Muſick* with her *antick Lyre*, having a *Pen* in her hand, and paper of *muſick notes* on her knee, with a *Genius* on her right hand (a little within the partition of *Theology*) playing on a *flute*, being the *emblem* of the moſt ancient *muſick*; and on the left (but within the partition for *Phyſick*) *Dramatick Poeſy*, with a *vizor* repreſenting *Comedy*, a *bloody dagger* for *Tragedy*, and the *reed pipe* for *Paſtoral*.

158. In the *ſquare* on the right ſide of the *Circle*, is *Law*, with her ruling *ſcepter*, accompanied with *Records*, *Patents*, and *Evidences* on the one ſide; and on the other with *Rhetorick*: by theſe is an attending *Genius* with the *ſcales* of *Juſtice*; and a *figure* with a *Palm branch*, the *emblem* of reward for *virtuous actions*; and the *Roman Faſces*, the marks of *Power* and *Puniſhment*. *Printing*, with a *Caſe* of *Letters* in one hand, and a *Form* ready ſet in the other, and by her ſeveral *ſheets* hanging as a drying.

159. On the left ſide the *Circle* oppoſite to *Law* is *Phyſick*, holding the *knotty ſtaff* of *Eſculapius*, with a *ſerpent* winding about it: The *Botaniſt* imploring the aſſiſtance of Truth in the right underſtanding of the nature of her *Plants*: *Chymiſtry* with a *Retort* in her hands: and *Chyrurgery* preparing her ſelf to finiſh the *diſſecting* of a head, which hath the *brain* already opened, and held before her by one of the *Genii*.

160. On the other ſide of the *circle* oppoſite to *Theology*, in three *ſquares* are the *Mathematical ſciences* (depending on *demonſtration*, as the other on *Faith*) in the firſt of which is *Aſtronomy* with the *Celeſtial globe*, *Geography* with the *terreſtrial*, together with

three attending *Genii*; having *Arithmetick* in the *ſquare* on one hand, with a paper of *figures*; *Optick* with the *Perſpective-glaſs*; *Geometry* with a pair of *compaſſes* in her left, and a Table with *Geometrical figures* in it, in her right hand: And in the *ſquare* on the other hand, *Architecture* embracing the *capitel* of a *column*, with *compaſſes*, and the *norma* or ſquare lying by her; and a *workman* holding another *ſquare* in one hand and a *plumb-line* in the other.

161. In the midſt of theſe *ſquares* and *triangles* (as deſcending from above) is the figure of *Truth* ſiting on a *cloud*, in one hand holding a *Palm-branch* (the *emblem* of *Victory*) in the other the *Sun*, whoſe brightneſs enlightens the whole *circle* of *figures*, and is ſo bright, that it ſeems to hide the face of *her ſelf* to the *ſpectators* below.

162. Over the *entrance* of the front of the *Theater* are three *figures* tumbling down; firſt *Envy* with her *ſnaky hairs*, *ſquint eyes*, *hags breaſts*, *pale venomous complexion*, *ſtrong but ugly limbs*, and *rivel'd skin*, frighted from above by the ſight of the ſhield of *Pallas*, with the *Gorgons* head in it, againſt which ſhe oppoſes her *ſnaky treſſes*, but her fall is ſo precipitous, that ſhe has no command of her *arms*.

163. Then *Rapine* with her *fiery eyes*, *grinning teeth*, *ſharp twangs*, her hands imbrewed in *blood*, holding a *bloody dagger* in one hand, in the other a *burning Flambeau*, with theſe *Inſtruments* threatning the deſtruction of *Learning*, and all its *habitations*, but is overcome and ſo prevented by a *Herculean Genius*, or *Power*. Next that is repreſented brutiſh ſcoffing *Ignorance*, endeavoring to vilifie and contemn what ſhe underſtands not, which is charmed by a *Mercurial Genius* with his *Caduceus*. Which is the ſum of what is deſigned by the *painting* of the *Theater*, for the moſt part thus deſcribed by *William Soper* M. A. of *Wadham College*, after of *Hart Hall*, only with ſome few additions and neceſſary alterations.

164. Beſide the *painting* of the *Theater*, there are other *fine pieces* perhaps as well worthy notice, ſuch are the *Reſurrections* at *Magdalen* and *All-ſouls Colleges*, both of *Fullers* work; though the latter indeed be ſomwhat defaced. The written *Picture* of his Majeſty King *Charles* the firſt, in St. *Johns College* Library, taking up the whole Book of *Pſalms* in the *Engliſh* tongue; and the written Picture of King *James*, and the *Arms* of *England* (as now born) taking up the whole Book of *Pſalms* in the *Latin*, in the hands

hands of Mr. *Moorhead* Rector of *Bucknel*, are pretty *curiosities*, and much admired.

165. And so is the *Cat* painted over one of the *compartments* including the *Arms* of the *University*, in the South side of the *gallery* at the *Schools*, for her looking directly upon all her *Beholders*, on what side soever they place themselves; which common, yet surprizing effect of the *Painters* Art, is caused, says the ingenious *Honoratus Faber* [x], in all *Pictures* whatever of this nature, by their turning the *nose* to one side and the *eyes* to the other; whence it comes to pass that such *Pictures* seem to look to the right side, because indeed the *eyes* are turned that way; and to the left in like manner, because the point of the *nose* is turned to the left: where by the way he also notes, that 'tis necessary that all such *pictures* be drawn on *flat tables*, so that the *Beholder* perceive not that the *eyes* of the *picture* are turned contrary to the *nose*; which he must needs do if the *eyes* of the portraict were *convex*, concluding, that no *figure* can be made in *Rilievo* thus to look every way.

166. To this place also belongs the *Invention* of drawing *pictures* by *Microscopical glasses* by Sir *Christopher Wren* [y], and the *Invention* of Mr. *Bird* Stone-Cutter or Carver of *Oxford*, of sinking a *colour* a considerable depth into the body of polish'd *white marble*, by application of it to the out-side only, so that the same *Figures* delineated without, shall be as perfectly represented within, deeper or shallower, according as he continues his application to the surface a longer or shorter while [z]. And if we may take in *Etching*, which is *painting* in Copper, there is a very curious and speedy way also *invented*, by the so often mentioned Sir *Christopher Wren* [a]. And which borders still on these, in the *Statuaries* Trade, we can shew two excellent *pieces* of *Art*, in the *Statues* of Brass of King *Charles* the first, and his Queen *Henrietta*, placed in the *Niches* over the gates of the new *Quadrangle* in Saint *John Baptist College Oxon.*

167. In some other Trades yet inferior to these, there have been made also considerable *Inventions* and *Improvements*, such as that of weaving *silk stockings*, first invented by one Mr. *William Lee* M. A. of this *University*, who being marryed and poor, and observing how much pains his *Wife* took in knitting a pair of *Stock-*

[x] *Honorati Fabri Tract. de Homine, Lib. 2. prop. 93. sub finem.* [y] History of the Royal Society, *Part. 2. sub finem.* [z] Philosoph. Transact. *Numb.* 7. [a] Hist. of the Royal Society, *Part. 2. sub finem.*

ings,

ings, put himſelf on thinking of a nearer way: whereupon having obſerved the contrivance of the *ſtitches* by unravelling a *ſtocking*, he deſigned a *Loom* accordingly, which ſucceeded ſo well, that (with but ſmall alteration) it remains the ſame to this very day.

168. And 'tis confidently vouched, that the *Engine* for cutting of *handles* of *Knives*, we commonly buy cut into thoſe various *figures*, was firſt *invented* and practiced here in *Oxford* by *Thomas Pierce* a Cutler, whoſe *Apprentice* now practices the ſame *Art* in *London*: But not with ſo much accuracy as *Robert Alder* another Cutler of *Oxford*, who only by obſervance of the others work, and long ſtudy, at laſt found it out alſo, and hath improved it much: which two laſt, as I am informed, are the only two *perſons* that can do this in *England*, perhaps I may ſay ith' *World*. Nor can I paſs by the Invention in the *Coopers* Trade, of making *barrels* without hoops, whereof I found a *ſpecimen* in St. *Ebbs* Pariſh *Oxon.* though I know the *Invention* belongs to another place, of which more when I come thither.

169. For *Improvements*, 'tis certain that the *Blanketing trade* of *Witney* is advanced to that height that no *place* comes near it; ſome I know attribute a great part of the excellency of theſe *Blankets* to the *abſterſive nitrous water* of the River *Windruſh* wherewith they are ſcoured, as was mentioned before, *cap.* 2. §. 12. but others there are again that rather think they owe it to a peculiar way of *looſe ſpinning* the *people* have hereabout, perhaps they may both concur to it: However it be, 'tis plain they are eſteemed ſo far beyond all *others*, that this place has engroſſed the whole *trade* of the *Nation* for this *Commodity*; in ſo much that the *wool* fit for their uſe, which is chiefly *fell wooll* (off from *Sheep-skins*) centers here from ſome of the furthermoſt parts of the *Kingdom*, *viz.* from *Rumney-marſh*, *Canterbury*, *Colcheſter*, *Norwich*, *Exeter*, *Leiceſter*, *Northampton*, *Coventry*, *Huntington*, *&c.* of which the *Blanketers*, whereof there are at leaſt threeſcore in this *Town*, that amongſt them have at leaſt 150 *Looms*, employing near 3000 poor people, from *children* of eight years old, to decrepit *old age*, do work out above a hundred packs of *wool* per week.

170. This *Fell wool* they ſeparate into five or ſix ſorts, *viz.* *long fell wooll*, *head wooll*, *bay wool*, *ordinary*, *middle*, and *tail wooll*: *Long fell* [illegible] they ſend to *Wells*, *Taunton*, *Tiverton*, *&c.* for making

king *worſted ſtockings*; of *head wool* and *bay wool*, they make the *blankets* of 12, 11, and 10 *quarters* broad, and ſomtimes ſend it, if it bear a good price, to *Kederminſter* for making their Stuffs, and to *Eveſham*, *Parſhore*, *&c.* for making *yarn ſtockings*; or into *Eſſex* for making *Bays*, whence one ſort of them I ſuppoſe is called *bay wool*: of the ordinary and middle they make *blankets* of 8 and 7 *quarters* broad; and of theſe mixt with the courſer *locks* of *fleece wooll*, a ſort of ſtuff they call *Duffields* (which if finer than ordinary, they make too of *fleece wooll*) of which *Duffields* and *blankets* conſiſts the chief Trade of *Witney*.

171. Theſe *Duffields*, ſo called from a Town in *Brabant*, where the *trade* of them firſt began (whence it came to *Colcheſter*, *Braintry*, *&c.* and ſo to *Witney*) otherwiſe called *ſhags*, and by the *Merchants*, *trucking cloth*; they make in *pieces* of about 30 yards long, and one yard $\frac{3}{4}$ broad, and dye them *red* or *blue*, which are the *colours* beſt pleaſe the *Indians* of *Virginia* and *New England*, with whom the *Merchants* truck them for *Bever*, and other *Furs* of ſeveral Beaſts, *&c.* the uſe they have for them is to apparel themſelves with them, their manner being to tear them into *gowns* of about two yards long, thruſting their *arms* through two holes made for that purpoſe, and ſo wrapping the reſt about them as we our *looſe Coats*. Our *Merchants* have abuſed them for many years with ſo falſe colours, that they will not hold their gloſs above a *months* wear; but there is an *ingenious perſon* of *Witney* that has improved them much of late, by fixing upon them a true *blue dye*, having an *eye* of *red*, whereof as ſoon as the *Indians* ſhall be made ſenſible, and the diſturbances now amongſt them over, no doubt the *trade* in thoſe will be much advanced again.

172. Of their beſt *tail wooll* they make the *blankets* of 6 quarters broad, commonly called *cuts*, which ſerve Sea-men for their *Hammocs*, and of their worſt they make *Wednel* for *Collar-makers*, *wrappers* to pack their *blanckets* in, and *tilt-cloths* for *Barge-men*. They ſend all the ſorts of *Duffields* and *Blankets* weekly in *waggons* up to *London*, which return laden with *fell wooll* from *Leaden-hall*, and *Barnaby-ſtreet* in *Southwark*, whether 'tis brought for this purpoſe from moſt places above-mention'd; *Oxford-ſhire* and the adjacent *Counties* being not able to ſupply them.

173. There are alſo in this Town a great many *Fell-mongers*, out of whom at the neighboring Town of *Bampton*, there ariſes

an-

another conſiderable *trade*, the *Fell-mongers ſheep-skins*, after *dreſſed* and *ſtrained*, being here made into *wares*, *viz. Jackets*, *Breeches*, *Leather linings*, *&c.* which they chiefly vent into *Berk-ſhire*, *VVilt-ſhire*, and *Dorſet-ſhire*, no *Town* in *England* having a *trade* like it in that ſort of *ware*.

174. Which two trades of the Towns of *VVitney* and *Bampton*, are the moſt *eminent*, that are too, the moſt *peculiar* of this *County*. The *Maulting trade* of *Oxford* and *Henly* on *Thames*, 'tis true are conſiderable, and *Burford* has been famous time out of mind for the making of *Saddles*; and ſo has *Oxford* had the reputation of the beſt *Gloves* and *Knives*, of any place in *England*; but theſe *trades* being not peculiar to the places where they are practiſed, I therefore paſs them by without further notice.

175. But the *Starch trade* of *Oxford*, though indeed it be not great, yet being practiced in few places, and the *method* known to fewer how it is made, its diſcovery perhaps may be acceptable to ſome, I ſhall not therefore ſtick to give a ſhort account of it. Let them know therefore, that the ſubſtance we commonly call *Starch*, notwithſtanding its pure *whiteneſs*, is made of the ſhorteſt and worſt *bran* that they make in the *Meal ſhops*, worſe than that they ſell to *Carriers* to feed their *Horſes*; This they ſteep in a *water* prepared for that purpoſe (by a ſolution at firſt of *Roch-Alum*, about a pound to a *Hogshead*, which will laſt for ever after) for ten or fourteen days in great *tubs*; then 'tis taken and *waſhed* through a large *Oſier basket* over three other *tubs*, the *ſower water* of the *ſecond tub* waſhing it into the *firſt*; and the *ſower water* of the *third*, into the *ſecond*; and clear water from the *Pump* waſhing it into the *third*.

176. Where by the way it muſt be noted, that only *Pump water* will ſerve the turn to give it this laſt *waſhing*, and continue the waters *ſowerneſs* for ever after, by reaſon I ſuppoſe of the inciſive particles of *ſalt* to be found in moſt *Pump waters* (which are plain from their not taking *ſoap*) that are apt to work upon and ſeparate the fineſt *flower* yet ſticking to the *bran* (notwithſtanding the *mill* and *ſieve*) which at laſt becomes *Starch*.

177. What remains in the *basket* at laſt after the three *waſhings*, is thrown upon the dung-hill, which, as they have found of late, becomes a very good *manure* for *meddow land*, and ſhould therefore have been mentioned in the 70 §. of this *Chapter*, amongſt the

the *uncommon manures*. And the fine *flower* thus waſhed from the *bran*, is let ſtand again in its own *water* for about a week, then being all ſetled at the bottom, it is ſtirred up again and freſh *Pump water* added, and ſtrained from its ſmalleſt *bran* through a *Lawn ſieve*; which done, they permit it to ſettle again, which it does in one day, and then they draw off the *water* from it all to a ſmall matter: then ſtanding two days more, it at laſt becomes ſo fixt, that with a burchen *broom* they ſweep the water left at the top, (which is a ſlimy kind of matter) up and down upon it to cleanſe it from filth, and then pouring it off, they waſh its ſurface yet cleaner, by daſhing upon it a bucket of fair *Pump water*.

178. Which done, they then cut it out of the *tubs* in great pieces with ſharp *trowels*, and box it up in *troughs*, having holes in the bottom to drain the *water* from it, always puting wet *cloths* between the wood and it, for the more commodious taking it out of the *troughs* again to dry, which they do within a day; laying it firſt on cold *bricks* for about two days, which ſuck away a great deal of *moiſture* from it, and after over a *Bakers oven* four or five days together, which will dry it ſufficiently, if intended only to be ground to *powder* for *hair*, as it is chiefly here; but if intended to be ſold as *ſtarch*, they then uſe a *ſtove* to give it the *ſtarch-grain*, which the oven will not do.

179. From the *inferior*, I proceed to the *ſuperior Arts* and *Sciences*, and others *inſtrumental* to them, for in theſe too, there have been many *Inventions* and *Improvements* made in this *Univerſity*. In enumeration whereof, if we begin ſo low as the very *Elements* of *Speech*, we ſhall find that the Reverend and Learned Dr. *Wallis*, *Savilian Profeſſor* of *Geometry* here, firſt obſerved and diſcovered the *Phyſical* or *Mechanical* formation of all *ſounds* in *Speech*, as plainly appears from his Treatiſe *de Loquela*, prefix'd to his *Grammar* for the *Engliſh* Tongue, firſt publiſh'd in the Year 1653.

180. In purſuance whereof, *he* alſo found out a way whereby he hath taught *dumb perſons* (who were therefore *dumb* becauſe *deaf*) not only to underſtand what they *read*, and by *writing* to expreſs their minds, but alſo to *ſpeak* and *read* intelligibly, according to directions for the artificial poſition and motion of the *Organs* of *Speech*, and thereby alſo aſſiſted others who have ſpoken very imperfectly. Of which no more, there being a particular

account given by *himself* in our *English Philosophical Transactions*, of *July* 18. 1670[b].

181. I know that the Right Reverend Father in God *John Wilkins*, late Lord Bishop of *Chester*, hath also laid down the distinct manner of forming all *sounds* in *Speech*, and shewed in *Sculpture* which *letters* are *Labial*, *Lingual*, *Nasal*, &c. and how the *Epiglottis*, *Larynx*, *Aspera Arteria*, and *Oesophagus*, conduce to them. Since *him*, in the Year 1669. the Reverend and Ingenious *William Holder* D.D. publish'd an *Essay* of Inquiry into the Natural Production of *Letters*, together with an *Appendix* to instruct persons *deaf* and *dumb*[c]. Yet whether either of these, with advantage of what Dr. *Wallis* did before, have with more accuracy of judgment performed the same, I dare not by any means take upon me to determine.

182. The same Dr. *Wallis* hath also, with great sagacity, deciphered many things written in *Cyphers*, of very intricate and perplext contrivance, beyond what hath been known to have been done by any other, whereof there be *Examples* of many in a MS. *Book* of his, reserved in the *Archives* of the *Bodleyan Library*.

183. Add hereunto the ingenious *Invention* of a *Universal Character*, or *Philosophical Language*, first contrived here at *Oxford* by Mr. *George Dalgarno* M. A, who in the Year 1656. endeavoring to improve the *Art* of *Short-hand* beyond what others had done, by expressing the *auxiliary Particles* of the *English* Language, by distinct *points* and *places* about the *radical* or *integral* words, after the manner that 'tis done by *prefixes* and *suffixes* in the *Hebrew*; found at last that there was no way to distinguish the *affixed points* which he intended to be used *really*, from those used before in the common way of *Short-hand* (where not only the *Capital Character*, but *points* about it were *Alphabetical*) but by making the *principal Character* it self, to which they were to be accessary, not *Alphabetical* but *real*.

184. Thus having formed *Tables* both of *Integrals* and *Particles*, to be expressed by single *Characters*, he perceived at length, that he was gone unawares further than ever he intended, having not only improved the *Art* of *Short-hand*, but also discovered a *real Character* equally applicable to all *Languages*: And after he

[b] Philosoph. Transact. *Numb.* 61. [c] Philosoph. Transact. *Numb.* 47.

had

had purſued the deſign of a *dumb Character* a conſiderable time, at laſt he perceived that it would naturally reſolve it ſelf into a *Language*, having this advantage over any *Character*, that we may uſe our known *Alphabet* to expreſs it, whereas in a *Character* the *figures* muſt be new. At length having digeſted his whole contrivance into a *Synopſis*, he communicated it to ſeveral *Learned Men*, whoſe approbation and certificates procured him good encouragement; but he met with no *Man* that took ſo much pains to underſtand the *Novelty*, or ſo zealous to have it finiſhed and come abroad, as the Reverend and Learned Dr. *John Wilkins* late Lord Biſhop of *Cheſter*, then the worthy Warden of *Wadham College*.

185. The laſt thing he attempted in his *Tables*, was the reducing the *ſpecies* of Natural Bodies to the rules of *Art*, the reaſon of which delay, was becauſe he perceived that they occurred but ſeldom in common diſcourſe, and that there was but little *Grammatical* difficulty about them, though in number they much excelled all the other *ſimple notions*, which make the body of a *Language*: His judgment then being, and as far as I can perceive, ſtill remaining unſhaken, notwithſtanding what has been done ſince, that from a few *general words* allowed to be *radical*, the names of the *inferior ſpecies* ſhould be made off by *compoſition*, adding to the *general* and *radical* word, one, or ſomtimes more ſuch *words* taken from the Table of *Accidents* as might deſcribe the intended *ſpecies*, and difference it from all *others*, and ſomtimes alſo to allow *Periphraſes*.

186. And this *Inſtitution*, as he takes it to be grounded upon *nature* and *neceſſity*, as appears more or leſs in all *Languages*, ſo he thinks it approved by the higheſt *Examples* that ever *Art* was: For *God* Himſelf named the firſt *Man*, though a ſingle *Individual*, not by a word of a *firſt*, but *ſecond inſtitution*; and *Adam* as a perfect *Philoſopher* imitating his *Maker*, named all living *Creatures* not by words of a *firſt inſtitution*, antecedently inſignificative, but by ſuch as by an *antecedent inſtitution*, might be apt to expreſs ſomthing of their *nature*, for otherwiſe the common opinion of *Divines* that *Adam* gave names to the *Creatures* according to their *natures*, would be abſurd.

187. Which *Inſtitution* he takes alſo to have this further *advantage*, that the name of any ſingle *ſpecies* may be known with-

out obliging the Learner to carry in his memory all the *Predicamental Series* of its fellow *Species*; ſo that *names* of common uſe may be known, paſſing by *others* that are not ſo, which to *Learners* is as great an encouragement, as the obtruding things not neceſſary is a diſcouragement to them. According to this *Inſtitution*, he publiſhed a *Specimen* called *Ars Signorum*, in the Year 1660. containing but 500 *Radicals*, all the *Particles* being brought from the *Radicals* by which they are reſolved; every *Radical*, except the *genera intermedia* being *Monoſyllables*, and all things elſe being made off from *theſe* by *compoſition*, which is allowed here in its fulleſt latitude, *Quidlibet cum quolibet pro re nata*, provided the *ſimple terms* looſe nor change nothing of ſignification, by *compoſition*.

188. But the Reverend and Learned Dr. *John Wilkins*, who throughly underſtood and commended his *labors* in the former part of the *work*, thinking perhaps that this way of *compoſition* would produce *too long* words, or that the various *conceptions* of *Men*, muſt needs cauſe different *compoſitions* and *deſcriptions* of the ſame *things*, and thence unavoidably bring miſunderſtandings (which yet Mr. *Dalgarno* thought might be avoided by ſtating of *notions* and a collection of *Formula's*) did not approve of this *Inſtitution*; declaring his judgment to be, that all the *ſpecies* of *Natural Bodies* (according as he owns, was ſuggeſted to him by that moſt learned and excellent perſon Dr. *Seth Ward*, the preſent Biſhop of *Salisbury* *) ought to be provided for as *Radicals*, by a regular enumeration of them according to the *Theories* of the *Schools*.

189. Nor did he approve of his rejection of a *Character*, ſince a graceful one might be contrived more proper for *Brachygraphy*, and equally convenient for many *Nations*, with the common *Alphabet*: Nor of his bringing the *Particles* from the *Radicals* by which they are reſolved; judging perhaps their *compoſition*, beſide the reducing ſome of them handſomly, more troubleſom than that, of learning a *ſmall*, yet *ſufficient* number of them diſpoſed regularly in *ſchemes*, and noted with ſmaller *Characters* than thoſe of *Integrals*. All which may be collected from the learned *Eſſay* towards a real *Character*, or *Philoſophical Language*, put forth by that highly ingenious perſon then Dean of *Rippon*, *An.* 1668.

* Eſſay towards a Real Character, in the Epiſtle to the Reader.

190. In

190. In which, though 'tis true the number of *Radicals* are near 3000, yet are they ſo ordered by the help of a *natural method*, that they may be more eaſily learned and remembred than 1000 words otherwiſe diſpoſed of, upon which account they may be reckoned but as 1000. For the *Signa* (they are ſo methodically contrived) they may be all learned in leſs than an hour, were they twice as many; the difficulty therefore muſt be in the *ſignata*, but theſe being drawn up in *ſchemes*, ſo that one notion will clearly depend upon another, they ſeem to be a perfect *artificial memory*, rather than require any help to be remembred. Notwithſtanding it leaves a large ſcope, enough for *derivation* and *compoſition*, as may be ſeen by the *Tables*, where ſeveral words, though no *Synonoma's* to it, may be made off from a *Primitive*, as *Queen*, *Crown*, *Scepter*, *Throne*, from the *Radical* [*King*]; and ſo from the *Primitive*, [*ſheep*] are made off, *ram*, *ewe*, *lamb*, *weather*, *mutton*, *bleat*, *fold*, *flock*, *ſhepherd*, *&c.* which compoſitions are clear, though the greateſt difficulty of the *Language* conſiſts in theſe.

191. Yet I ſhall not offer to determine which of theſe is to be preferr'd, leaving that wholly to the *Readers* judgment, who may conſult both *Treatiſes*: It being ſufficient for me, that a *Univerſal Character* and *Philoſophical Language* can be no more reckoned amongſt the *Deſiderata* of Learning, and that the defect was firſt ſupplyed here at *Oxford*; the Contrivances of *both* being firſt founded *here*, and both grounded upon rational and ſolid principles, with greater advantages of facility, than can be believed poſſible to any that have not made tryal. And this is all concerning *Letters* and *Language*, but that *John Baſinſtoke* alſo an *Oxford man*, *Figuras Græcorum numerales in Angliam portavit, & earum notitiam ſuis familiaribus ſignificavit, de quibus figuris hoc maxime admirandum, quod unicâ figurâ quilibet numerus ſignificatur, quod non eſt in Latino vel in Algoriſmo* [d].

192. In *Logick* the ſubtile *Johannes Duns Scotus*, Fellow of *Merton College*, was the *Father* of the Sect of the *Reals*; and his Scholar [e] *Gulielmus Occham*, ſomtimes falſly printed *Holran*, of the ſame *Houſe*, Father of the Sect of the *Nominals*, betwixt whom as the ſtory goes, there falling out a hot Diſpute (*Scotus* being then *Dean* of the *College*, and *Occham* a *Bachelor Fellow*) where-

[d] Matth. Paris, *Hiſt. Angl. in Anno* 1252. *pag.* 835. *Edit.* Watſiana. [e] *Vid.* Johannis Lelandi *collectanea de Viris Illuſtribus.*

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in though the *latter* is ſaid to have obtained the better, yet being but an *inferior*, at parting ſubmitted himſelf with the reſt of the *Bachelors* to the *Dean* in this form, *Domine quid faciemus*, as it were begging puniſhment for their boldneſs in *arguing*; to whom *Scotus* returning this anſwer, *Ite, & facite quid vultis.* They forthwith brake open the *Buttery* and *Kitchin doors*, taking all they could meet with, making merry with it all night: Which, 'tis ſaid, gave occaſion to their obſerving the ſame *diverſion* to this very day, whenever the *Dean* keeps the *Bachelors* at *Diſputations* till twelve at night, which they now commonly call a *Black night.*

193. *Rogerus Swiſſet*, alias *Swinſhead*, of the ſame *College*, was the firſt Contriver of the *Art Calculatory* in *diſputation*, wherein ſays the Learned *Selden*, *Multiplicatis particulis negativis & trajectis per eſſe, & non eſſe, Calculo* (which was *Beans* and *Peas*) *opus erat, quoties erat diſputandum* *. But others who have conſulted more of his *Works* than I ſuppoſe Mr. *Selden* ever did, rather think this *Art Calculatory*, to be ſome way he had to determine the *proportions* of matters capable of *proportion* or *degrees*, ſuch as *action*, *motion*, *reaction*, *intenſion*, *remiſſion*, *&c.* whereof the *Reader*, if he think it worth while, may further ſatisfie *himſelf* from his Printed Works; ſuch as his *Introductorium in Calculationem*, his *Calculationes cum Quæſt. de Reactione*, his Treatiſes *de intenſione & remiſſione*, *maximo & minimo*; to which add, *M. Baſſani Politi*, *Introductorium in Calculationes Swiſſet*, moſt of which, if not all, are in *Merton College* Library.

194. The ſame *Roger Swiſſet* found out many things in *Mathematicks*, which no body found before him, *& perpauci poſt eum jam Inventa comprehendere valuerunt*, ſays *Pitſeus* of him [f]. And the Honorable *Robert Dudley* of *Chriſt Church College Oxon* (made *Duke* by the *Emperor* [g], with the Title of *Northumberland* here in *England*, whereof he fanſied himſelf wrongfully deprived) contrived many *Engines* and *Mathematical Inſtruments* not known before, now in the poſſeſſion of the *Great Duke* of *Tuſcany*, to whoſe *Anceſtors* he applyed himſelf in his diſcontent, by whom he was ſuccor'd and highly valued for his great *Learning*, and with *whom* his *Children* now remain to this day in *Wealth* and *Honor*, retain-

* *Vid. Comment. in Carmen Phaleucium, Joh. Seldeni*, before *Hoptons* Concordance of Years. [f] *Vid.* Pitſei *Relationes Hiſt. de rebus Angl. præſertim de Scriptoribus in An.* 1350. [g] *Hiſt. & Antiquitates Univerſitatis* Oxon. *per* Anthonium à Wood, *lib.* 2. *pag.* 275.

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ing the Titles of *Dukes* of *Northumberland* and *Earls* of *Warwick* and *Leiceſter*; which Titles others ſay, and perhaps more rightly too, were conferred on them by the *Pope*, in whoſe Quarrel they were pretended at leaſt to have been loſt [h].

195. Of later years the highly ingenious Sir *Chriſtopher Wren*, in the year 1668. firſt found out a *ſtraight line* equal to a *Cycloid* and the parts thereof, as is clearly made appear in his behalf by the Right Honorable and Learned, the Lord Viſcount *Brouncker*, Chancellor to Her Majeſty, and *Preſident* of the *Royal Society*; and the Reverend and Learned Dr. *John Wallis* [i]. The ſame Right Worſhipful and very learned Perſon Sir *Chriſtopher Wren*, found out alſo ſeveral new *Geometrical Bodies*, that ariſe by the application of two *Cylinders* and one *Lenticular Body*, fit for grinding one another; by whoſe mutual *attrition* will neceſſarily be produced a *Conoides Hyperbolicum*, and two *Cylindroidea Hyperbolica*: The *Engine* whereby this may be done being repreſented in *Sculpture* in our *Philoſophical Tranſactions*, and deſigned for grinding *Hyperbolical glaſſes* [k]. He alſo firſt obſerved that a *plain ſtraight edged Chiſel*, ſet any way obliquely to a *Cylinder* of wood, did neceſſarily torn it into a *Cylindroides Hyperbolicum Convexo-concavum*, the ſeveral *ſections* whereof are accuratly demonſtrated by the Reverend and Learned Dr. *John Wallis* our Engliſh *Archimedes* [l].

196. The ſame Dr. *John Wallis*, *Savilian* Profeſſor of *Geometry* in this *Univerſity*, in the year 1656. publiſhed his new *method* called his *Arithmetick* of *Infinites*, for the more expedite and effectual enquiry into the *Quadrature* of *Curvilinear* figures, or other difficult *Problems* in *Geometry*; and therein, amongſt other things (at the *Scholium* of his 38 *Propoſition*) ſhewd the way of comparing *ſtraight* and *crooked* lines, which gave occaſion to Mr. *William Neil* (in purſuance thereof) in the year 1657. to find out (the firſt of any Man) a *ſtraight* line equal to a *Curve*, of which we have an account in the *Philoſophical Tranſactions* of *Novemb.* 17. 1673 [m].

197. The ſame Reverend and Learned Dr. *John Wallis*, amongſt his other numerous and new Performances in *Arithmetick* and *Geometry*, firſt demonſtrated the impoſſibility of ſquaring the *Circle*, *Arithmetically*, according to any way of *notation* yet ge-

[h] *Ex Itinerario* Joh. Bargrave *S. T. P. & Præbend. Eccleſiæ Chriſti Cant.* MS *penes ſeipſum.* [i] Philoſoph. Tranſact. *Numb.* 98. [k] *Ibid. Numb.* 53. [l] *Walliſii Mechanica, ſive de Motu, part.* 2 *de Calculo Centri gravitatis, cap.* 5. *Prop.* 32. [m] Philoſoph. Tranſact. *Num.* 98.

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nerally received [n], and what kind of new *notation* must be introduced to express it, with divers *methods* of *squaring* the *Circle*, *Ellipsis*, and *Hyperbole*, so far as the nature of *Numbers* will bear, having apply'd his *method* of *Infinites* in order thereunto; as also for rectifying of *Curve-lines*, plaining of *Curve-surfaces*, squaring of innumerable sorts of *Curve-lined* figures, plain and solid (amongst which are a multitude of *figures* of *infinite* length, and *finite* content) determining their *Centers* of *Gravity*, and other *accidents*.

198. He has also adjusted the strength of *percussions* and *reflexions* (or *repercussions*) and other motions to *Geometrical* measures, deduced from principles of *Elasticity*; and has estimated the *artificial* force acquired in all sorts of *Mechanick Engins*, deduced from our common principle of the *Reciprocation* of *Strength* and *time*; with many other improvements of *Arithmetick*, *Algebra*, *Geometry*, *Mechanicks*, and other parts of *Mathematicks*, in his *Arithmetick* of *Infinites*, his Treatise of the *Cycloid*, with that adjoyned of the *rectification* of *Curves*; his Treatise of *Motion*, and other his Printed *Works*.

199. In *Musick* (which is *Arithmetick* adorned with *sounds*) to pass by a *Harpsechord* that I met with at Sir *Tho. Penystons* with *Cats-gut* strings. It hath been lately observed here at *Oxford*, that though *Viol* or *Lute* strings rightly tuned do affect one another, yet most of them do it not in all places alike, as has till now been supposed: for if the lesser of two *Octaves* be touched with the hand or bow, each half of the greater will answer it, but will stand still in the *middle*; and if the *greater* of the two *Octaves* be touched on either of its *halves*, all the *lesser* will answer it, but if touched on the *middle*, the *lesser* will not stir any where at all. So if the *lesser* string of two *fifths* be touched on either of its *halves*, each *third* part of the *greater* will answer it, but if on the *middle* they will not stir; and if the *greater* of two *fifths* be touched on either of its *thirds*, each *half* of the *lesser* will answer it, but if in the *divisions* they will not stir: and so of *twelfths*, *fifteenths*, *&c.*

200. Which *Phænomena* I shall always gratefully acknowledge were first discovered to me by the ingenious *Thomas Pigot* B. A. and Fellow of *Wadham College*, which have also been observed for about these two *years*, by the no less ingenious *William Noble* M. A.

[n] *Vid. Arithmeticam Infinitorum, Prop.* 190. *cum Scholio sequ.*

of

of *Merton College*: The ſolution whereof in all their *Caſes*, as received from the learned and accurate hand of the Reverend *Narciſſus Marſh* D. D. and Principal of St. *Alban* Hall, one of the moſt cordial *Encouragers* of this *Deſign*, take as followeth: which though ſo exquiſitely done, that it ſeems not capable of much addition or amendment, yet he modeſtly will have called but a ſhort *Eſſay* touching the (eſteemed) *Sympathy* between *Lute* or *Viol* ſtrings.

201. Wherein *he* firſt lays it down as a *Poſtulatum*, that if two *Lute* or *Viol* ſtrings be rightly tuned, the one being touched with the hand or bow, the other will *anſwer*, or tremble at its motion, which holds alſo in ſome meaſure in *Wire ſtrings*; and between *Organ pipes* and *Viol ſtrings*, but not between *Wire* and *Viol ſtrings*. For the clearer ſolution of which *Phænomenon* in all its *caſes*, he has laid down theſe two following *Principles*.

Princip. 1. *That ſtrings which are Uniſons are of the ſame, or a proportionable length, bigneſs, and tenſion; ſo that by how much any ſtring is longer than other*, cæteris paribus, *by ſo much ſmaller, or more tended; and by how much bigger, by ſo much ſhorter or more tended muſt it be, to render them Uniſons*, w^ch will appear in the following *Caſes*. Whereunto *he* premiſeth,

That in *ſtrings* moved by an equal *force*, through a like *medium*, the difference of *motion* does ariſe from the difference of *magnitude* and *tenſion*, wherefore (the *force* and *medium* being alike) *he*

Premiſeth 1. That *ſtrings* of the ſame *cize* move equally faſt, becauſe they cut the *Air* with the ſame *facility*. Hence

2. That the *greater* any *ſtring* is in *diameter* (or circumference) the *ſlower* it moves (and on the contrary) becauſe it finds the greater reſiſtance in the *Air*.

3. That *ſtrings* of the ſame *length* and *tenſion* move to the ſame *diſtance*, becauſe they have the ſame *compaſs* to play. Hence

4. That the *longer*, or *leſs* tended, any *ſtring* is, the farther it moves (and on the contrary) becauſe of the *greater compaſs* it can fetch.

Whence he infers this *Concluſion*,

That (in *ſtrings* moved through the ſame *medium*) the *ſwiftneſs* of *motion* does ariſe from the *greater* force, and *leſs* cize or bigneſs; the *compaſs* of *vibration*, from the *greater* length (or force) and

leſs tenſion; and the *quickneſs* or *frequency* of *vibration*, from the *greater* or *ſwifter* motion, and *leſs* compaſs.

202. This premiſed, *he* proceeds to his firſt *Hypotheſis*, and ſhews, that if *A B* and *C D*, *Tab.* 15. *Fig.* 1. be equal in length, as in *Viol ſtrings*, what *ſounds* and *vibrations* they will produce according to their different *bigneſs* and *tenſion* in the following *Caſes*.

Caſ. 1. Let *A B* = (*i. e.* be equal to) *C D*, *Tab.* 15. *Fig.* 1. have the ſame *cize* and *tenſion*, and be touched with an equal *force*, they will *vibrate* to equal diſtances *EG*=*IK* (*per præmiſſam* 3) in the ſame time (*per præm.* 1.) whereby ſtriking the *Air* into alike *arches*, or *arches* of equal *circles*, with the ſame briſkneſs, and alike quick or frequent returns of their *vibrations*, they will produce the ſame ſound, and ſo be *uniſons*, 1 to 1 *vibration*.

Caſ. 2. Let *A B*=*C D*, *Fig.* 1. have the ſame *cize* and a *greater tenſion*, 'twill with the ſame *force*, *vibrate* proportionably to a leſs diſtance (*per præmiſ.* 4.) in a *ſhorter* time (*per præm.* 1.) as, if *double* the *tenſion*, to *half* the *diſtance* $EF=\frac{1}{2}EG$ or *IK*, in half the *time*; ſtriking the *air* into an *arch* of a greater *circle* (and that ſo much the *greater*, as *AB* is a *chord* of fewer degrees to *A G B*, the *leſs*) which doing briſk and ſmartly with a quick return, becauſe of the little compaſs it fetches, 'twill beget a *ſound* ſo much the more *acute*, as its *vibrations* (are ſhorter, and thereby) come thicker and oftner; *i. e.* of double the *acuteneſs*, or an upper *octave* to *C D* 2 to 1 *vibration*.

Caſ. 3. Let *A B*=*CD*, *Tab.* 15. *Fig.* 2. have a greater *cize* and the ſame *tenſion*, it will with the ſame *force*, *vibrate* to the ſame *diſtance E G*=*IK* (*per præm.* 3.) but in a longer *time* proportionably (*per præm.* 2.) as, if it be double in *diameter* (and ſo in *circumference*, *i. e. quadruple* in *bulk*) in twice the *time*; ſtriking a *Note* ſo much the more *grave*, as its *vibrations* return ſlower and ſeldomer, and are thereby fewer, *i. e.* twice as *grave*, or an under *octave* to *C D*, 1 to 2 *vibrations*.

Caſ. 4. Let *A B*=*C D Fig.* 2. have as much greater a *cize* as *tenſion*, it will, with an equal *force*, *vibrate* to a leſs *diſtance*

pro-

proportionably ; as if double the *cize* and *tenſion*, to half the *diſtance* $E F = \frac{1}{2} E G$ or $I K$ in the ſame *time* (*per Caſ.* 2. & 3.) and ſo keeping touch in their *vibrations*, they will ſtrike *uniſons* 1 to 1 *vibration*.

Caſ. 5. Let $A B = C D$ *Fig.* 2. have as much greater *cize* as leſs *tenſion*, 'twill with the ſame force *vibrate* to a greater *diſtance* proportionably, in a time greater in a duplicat *proportion* ; as if double the *cize*, and but half the *tenſion*, to double the *diſtance* $E H = 2 E G$ or $I K$, in quadruple the *time* (*per Caſ.* 2. & 3.) and ſo will ſtrike an under *diſdiapaſon* or 15th to $C D$, 1 to 4 *vibrations* ; as on the contrary $C D$ to $A B$ an *upper*, 4 to 1 *vibr.*

Where by the way *he* gives notice, that when *he* ſpeaks of *ſtrings* (of a different *cize*) being moved by the ſame or an equal *force* (which is alſo to be underſtood in all the following *caſes* where not expreſt) that he means it that way their *gravity* does propend, *viz.* downward in thoſe that are *Horizontally* ſtreined, leſt their proper *gravity* might be thought to cauſe a difference.

203. Thus having abſolved his *firſt Hypotheſis* concerning *ſtrings* of equal length, he proceeds to his *ſecond*, and ſhews that if $A B$ and $C D$, *Fig.* 3. be unequal in *length*, as in moſt *Lute-ſtrings*, what *vibrations* and *ſounds* they will produce, according to their different *cizes* and *tenſion* alſo in the following *Caſes*.

Caſ. 1. Let $A B \succ$ (*i. e.* be longer than) $C D$, *Tab.* 15. *Fig.* 3. have the ſame *cize* and *tenſion*, it will with an equal *force*, *vibrate* proportionably to a greater *diſtance* (*per præm.* 4.) in a greater time (*per præm.* 1.) as if twice as *long* to double the *diſtance*, $LN = 2 LM$: For $AL. LN :: CL. LM.$ (& $AN. CM :: NL. ML.$ [*per* 4. 6. *Euc.*] *ergo Arch.* $AN = Arc. CMD$) and that in twice the time ; ſtriking the *air* into an *arch* of a *circle* of double the *Radius* ; by which double ſlower return of its *vibrations*, 'twill produce a ſound twice as *grave*, or an *under octave* to CD. 1 to 2 *vibrations*.

Caſ. 2. Let $AB \succ CD$ *Fig.* 3. have the ſame *cize*, and a *tenſion* as much *greater* as 'tis *longer*, 'twill with an equal *force*, *vibrate* to the ſame *diſtance* LM (*per præm.* 4. *vel per Caſ.* 1. *Hyp.* 2. & *Caſ.* 2. *Hyp.* 1.) in the ſame time (*per præm.* 1.) ſtriking the *air* (with alike briſkneſs) into an *arch* of a *circle*, ſo much

much greater proportionably, as *CD* is the *chord* of fewer *degrees*, and ſo will produce alike ſounds or *uniſons*. 1 to 1 *vibration*.

Caſ. 3. Let *AB* ▷ *CD*, *Fig.* 3. have the ſame *cize* and a *tenſion* as much *leſs*, as 'tis *longer*; 'twill *vibrate* to a *diſtance*, and in a *time* greater in a duplicate *proportion* (*per præm.* 4. & 1. *vel per Caſ.* 1. *Hyp.* 2. & *Caſ.* 2. *Hyp.* 1.) as, if being double, it has but half the *tenſion* to quadruple the *diſtance LO*=4 *LM* in quadruple the *time*, and ſo will produce a ſound 4 times as *grave*, or an under *diſdiapaſon* to *CD* 1 to 4 *vibr.*

Caſ. 4. Let *AB* ▷ *CD*, *Tab.* 15. *Fig.* 4. have a *cize* as much *greater* as 'tis *longer*, and the ſame *tenſion*. 'twill *vibrate* to a *greater diſtance* proportionably (*per præm.* 4. *vel per Caſ.* 1. *Hyp.* 2.) in a *time* greater in a *duplicate proportion* (*per præm.* 2. *vel per Caſ.* 3. *Hyp.* 1.) as if double in *length* and *cize*, to double the *diſtance PR*=2 *PQ* in quadruple the *time*; and ſo will ſtrike an under *diſdiapaſon* or 15th to *CD*. 1 to 4 *vibr.*

Caſ. 5. Let *AB* ▷ *CD*, *Tab.* 15. *Fig.* 5. have a *cize* as much *leſs* as 'tis *longer*, and the ſame *tenſion*; 'twill with the ſame *force*, *vibrate* to a greater *diſtance* proportionably (*per præm.* 4. *vel Caſ.* 1. *Hyp.* 2.) as if twice as long to double the *diſtance TX*=2 *TV*, in the ſame *time* (*per præm.* 2.) and ſo keeping pace in their *vibrations* will ſtrike *uniſons*, 1 to 1. *vibr.*

Caſ. 6. Let *AB* ▷ *CD*, *Fig.* 4. have both *cize* and *tenſion* as much *greater* as 'tis *longer*, 'twill *vibrate* to the ſame *diſtance PQ* (*per præm.* 4. *vel Caſ.* 2. *Hyp.* 2.) in a longer *time* proportionably (*per præm.* 2.) as if double the *cize*, in twice the *time*, and ſo will ſtrike an under *octave*, 1 to 2 *vibrations*.

Caſ. 7. Let *AB* ▷ *CD*, *Fig.* 5. have both *cize* and *tenſion* as much *leſs*, as 'tis *longer*; 'twill *vibrate* to a *diſtance* greater in a *duplicate proportion* (*per. Caſ.* 3. *Hyp.* 2.) in a *time* proportionably greater (*per præm.* 2.) as if double the *length*, it has but half the *cize* and *tenſion*, to quadruple the *diſtance TT*=4 *TV* in twice the *time*, and ſo will ſtrike an under *octave* 1 to 2 *vibr.*

Caſ. 8. Let *AB* ▷ *CD*, *Fig.* 4. have a *cize* as much *greater*, and a *tenſion* as much *leſs* as 'tis *longer*; 'twill *vibrate* to a *diſtance* greater in a *duplicate proportion* (*per Caſ.* 3. *Hyp.* 2.) in a *time* greater in a *triplicate proportion* (*per præm.* 2.) as if double

ble in length and *cize*, and but half ſo much *tended*, to quadruple the *diſtance* $PS=4PQ$ in octuple the *time*; and ſo will ſtrike an under *triſdiapaſon*, or a 22^{d}, 1 to 8. *vibr.*

Caſ. 9 Let $AB \rhd CD$, *Fig.* 5. have a *cize* as much *leſs*, and a *tenſion* as much *greater* as 'tis *longer*; 'twill *vibrate* to the ſame *diſtance* TV (*per Caſ.* 2. *Hyp.* 2.) in a time proportionably *leſs* (*per præm.* 2. *vel Caſ.* 3. *Hyp.* 1.) as if half the *cize* in half the *time*; and thereby will ſtrike an upper *octave*, 2 to 1 *vibr.*

All which *Caſes*, may be thus briefly expreſſed (putting T for *Tenſion*, D for the *Cize* or *Diameter*, and L for the *length* of the *ſtring*:) ſuppoſing $\frac{T}{LXD}=1$ to be the *acuteneſs* of the ſound propoſed (to which you compare the reſt) the *acuteneſs* in the other *caſes* compared to it, will be in the *proportions* following reſpectively.

Hypoth. 1. *Caſe* 1. $\frac{T}{LxD}=\frac{1}{1}$. 2. $\frac{2T}{LxD}=\frac{2}{1}$. 3. $\frac{T}{Lx2D}=\frac{1}{2}$. 4. $\frac{2T}{Lx2D}=\frac{1}{1}$. 5. $\frac{\frac{1}{2}T}{Lx2D}=\frac{1}{4}$.

Hypoth. 2. *Caſe* 1. $\frac{T}{2LxD}=\frac{1}{2}$. 2. $\frac{2T}{2LxD}=\frac{1}{1}$. 3. $\frac{\frac{1}{2}T}{2LxD}=\frac{1}{4}$. 4. $\frac{T}{2Lx2D}=\frac{1}{4}$. 5. $\frac{T}{2Lx\frac{1}{2}D}=\frac{1}{1}$.

6. $\frac{2T}{2Lx2D}=\frac{1}{2}$. 7. $\frac{\frac{1}{2}T}{2Lx\frac{1}{2}D}=\frac{1}{2}$. 8. $\frac{\frac{1}{2}T}{2Lx2D}=\frac{1}{8}$. 9. $\frac{2T}{2Lx\frac{1}{2}D}=\frac{2}{1}$.

The reaſon of which manner of expreſſion, depends on this; that (in *Proportions* expreſſed after the manner of *Fractions*) *increaſing* that above the line, doth *increaſe* the value (and ſo doth the *increaſe* of *Tenſion*, *increaſe* the *acuteneſs*:) But *increaſing* that under the line, doth *diminiſh* the *value* (and ſo doth the *increaſe* of the *length*, and the *increaſe* of the *cize*, *diminiſh* the *acuteneſs*) in the ſame *proportion*. Which may ſerve for a brief *demonſtration* of the whole.

By which may be judged of, all other more mixt or compound *Caſes*, which are infinite, according to the divers unequal proportions, of *length*, *bigneſs*, and *tenſion*; but being all made out of, or founded on *theſe*, they will all hold true in *Analogy* to them.

204. From many of which *Caſes* 'tis plain and eaſie, that the *ſympathy* and *conſent* of *ſtrings* lies not wholly in their like *tenſion* and

and formation of *pores*, as was ſuppoſed §. 24. of the firſt *Chapter* of this *Book*. Whence alſo 'tis equally eaſie to make theſe three following *Illations*.

1. That *ſtrings* agreeing in either *length*, *bigneſs*, or *tenſion*, can be made *uniſons* but four ways. 1. If they be of the ſame *length*, *bigneſs*, and *tenſion* (*per Caſ.* 1. *Hyp.* 1.) 2. Of the ſame *length*, and one a *cize* and *tenſion* equally greater than the other (*per Caſ.* 4. *Hyp.* 1.) 3. Of the ſame *cize*, and one a *length* and *tenſion* equally *greater* (*per Caſ.* 2. *Hyp.* 2.) 4. Of the ſame *tenſion*, and one as much *longer* as 'tis *leſs* (*per Caſ.* 5. *Hyp.* 2.) and after the ſame manner when they diſagree in all *three*, as will be obvious to the *conſidering*: Wherefore *uniſons* are always *ſtrings* of the ſame, or a proportionable *length*, *bigneſs*, and *tenſion*.
2. That *uniſons* may be moved by the ſame *force*, in the ſame *time*; or being moved by the ſame or an equal *force*, will *vibrate* in the ſame *time*; as is manifeſt in the fore-mentioned *Caſes*, to which all others bear *Analogy*.
3. That *octaves* being moved by the ſame or an equal *force*, the upper will *vibrate* in half the *time*, that the under does, or twice to its once (*per Caſ.* 2 & 3. *Hyp.* 1. & *Caſ.* 1, 6, 7, & 9. *Hyp.* 2.) wherefore they can by no *force* be made to *vibrate* together; for as much as the ſame *ſtring* (being of the ſame *length* and *tenſion*) always *vibrates* in the ſame *time*; a greater *force* only making it fly out to a greater *diſtance*, or fetch a greater *compaſs* in its *vibrations*, and thereby *move* (but not *vibrate*) faſter, *per Concluſ. poſt Præmiſſas.* And the ſame is verified concerning all other *Notes*.

205. Having done with his *firſt Principle*, with the *Hypotheſes*, and ſeveral *Caſes* attending it, the ſame Reverend and Learned Dr. *N. M.* proceeds to his ſecond *Principle*, *viz. That all tuned ſtrings either are or conſiſt of uniſons*, which will plainly appear from the diviſion of the *Monochord*; where,

1. *Uniſons* are as *AB* to *BC*, *Fig.* 6. 1 to 1 *part*, or *vibration*, *per Illationem* 1. & 2.
2. A *Diapaſon* or *Octaves*, as *BC* to *CD*, *Fig.* 7. 1 to 2 *Uniſons*, or 2 to 1 *Vibrat. per Illat.* 3.
3. A *Diapente*, or perfect *fifths*, as *CD* to *DE*, *Fig.* 8. 2 to 3 *Uniſons*, or 3 to 2 *vibrat.* 4. A

4. A *Diateſſeron*, or *fourths*, as *DE* to *EF*, *Fig.* 9. 3 to 4 *Uniſons*, or 4 to 3 *vibrat.*
5. A *Ditone*, or greater *thirds*, as *EF* to *FG*, *Fig.* 10. 4 to 5 *Uniſons*, or 5 to 4 *vibrat.*
6. A *Semiditone*, or leſſer *thirds*, as *FG* to *GH*, *Fig.* 11. 5 to 6 *Uniſons*, or 6 to 5 *vibrat.*
7. A *Diapaſon* with a *Diapente*, or *twelfths*, as *IK* to *KL*, *Fig.* 12. 1 to 3 *Uniſons*, or 3 to 1 *vibrat.*
8. A *Diſdiapaſon* or *fifteenths*, as *MN* to *NO*, *Fig.* 13. 1 to 4 *Uniſons*, or 4 to 1 *vibrat.*

And ſo for the reſt, whereof the chief may be expreſſed on one line, *Fig.* 14.

Where
- *AB. AC.* or *AC. CG* or *AD. AG.* are } 8.
- *AC. AD.* or *AE. AG.* 5.
- *AD. AE.* 4.
- *AE. AF* 3ma.
- *AF. AG.* 3mi.
- *AD. AF.* 6.
- *AC. AF.* 10.
- *AB. AD.* or *AB. BE.* or *AC. AG.* } 12.
- *AB. AE.* or *AB. BF.* or *AB. CG.* } 15.
- *AB. AF.* or *AB. BG.* 17.
- *AB. AG.* 19.

206. And thus much for his *Principles*, whence he goes on to ſome ſpecial or *particular Propoſitions*, in order to demonſtrate the late obſerved *Phænomena*, which immediatly follow.

Prop. 1. *If two ſtrings be tuned Uniſons* AB. BC. Fig. 6. *and either be touched with the hand or bow, the other will anſwer it, by trembling at its motion.*

For the *Air* being put into an *arched figure* and *motion* by the *ſtring* that is touched, rolls away to the other, which finding of a *length*, *bigneſs*, and *tenſion*, that are the ſame, or proportionable (*per Illat.* 1.)it eaſily (by the *force* it received from the touched *ſtring*) imprints

imprints both *figure* and *motion* into it, in the *first Case* (*per Caſ.* 1. *Hyp.* 1. *Princ.* 1.) or elſe communicates its *motion* only, in the *ſecond*, (*per Illat.* 2.) whereby the next undulation of *Air*, from the touched *ſtring*, taking it juſt at its return, and in like manner the conſequent ones, and moving it as before, they continue their *vibrations* together, *paſſibus æquis*, *Q. E. D.*

Prop. 2. *If the leſſer of two Octaves* BC, *be touched* Fig. 7. *each half of the greater* C2, 2D *will anſwer it, the middle* 2 *ſtanding ſtill*; which he thus demonſtrates.

About *CD* wrap looſly 3 narrow *ſtrips* of *paper*, one in the middle 2, the other betwixt *C*2 and 2*D* (*exemp. gr.* in *p* and *q*) then with the *finger* or *bow* ſtrike *BC*, or any part of it, and you will ſee the papers in *p q*, dance and play up and down and about the ſtring, 'twixt *C*2 and 2*D*, but that in 2 ſtand ſtill. Whence it is evident, that *CD* moves in its two *halves*, by two *diſtinct* motions. Which he thinks occaſioned by the arched *Airs*, ruſhing with the *force* of *BC* againſt all *CD*, and moveing it ſomwhat forward out of its place; but finding it of a diſproportionate *length*, *bigneſs*, and *tenſion*, to be excited by ſo quick *vibrations*, as may correſpond with thoſe of *BC*, and the undulations whereinto they ſtrike the *Air* (by which alone it cauſes any ſtring to *vibrate*) *per Illat.* 3. the ſecond *undulation* of the *Air* from *BC* meets *CD* juſt at its return (*CD*'s *vibrations* to *BC*'s, and the *Airs undulations* cauſed thereby, being as 1 to 2) whereby it is beat back, and rebounds from 2 towards *BC*, when the third *undulation* from *BC* occurring, forces it forward again; whereupon (not being able to move backward nor forward) the *undulations* break and roll away to each ſide, towards *C* and *D*. Which parts *C*2. 2 *D* being *Uniſons* to *BC*, *per Princip.* 2. it eaſily moves them *per Prop.* 1. and ſo, (though *Des Cartes* denys it [o]) they apparently *vibrate* in *p q* (*vid. Fig.* 15.) by two *diſtinct* motions, *Q. E. D.*

Prop. 3. *If the greater of two Octaves* CD *be toucht on either of its halves* C2. 2D. *all the leſſer will anſwer it, but if on the middle* 2 *it will ſtir no where.* Which is thus demonſtrated.

About *BC*, *Fig.* 7. wrap looſly one *ſtrip* of *paper*, then with the *finger* or *bow*, ſtrike *CD* on either *half*, *C*2 or 2 *D*, and you will ſee

[o] *Des Cartes Muſ. Comp. p.* 5.

the

the paper dance and play as before, and that in all parts of *BC* alike; but if you ſtrike it on the *middle* 2, the paper will not ſtir. The reaſon whereof ſeems to be, that C2. 2D being *Uniſons* to *BC*, *per Princip.* 2. if either be touched, *BC* will anſwer it, *per Prop.* 1. But *CD* having a diſproportionate *length*, *bigneſs* and *tenſion* to *BC*: if touched in 2 (whereby the whole *ſtring* is equally moved) it cannot affect it, by reaſon of their different *vibrations*; as in the former *Propoſition*, *Q. E. D.*

Note that this, and (eſpecially) the following *Experiments*, muſt be tryed curiouſly by a gentle touch of the *ſtring* (only ſo hard as to make the *papers* move) and that with a *bow* rather than the *finger*: For if *CD* be touched boldly in 2 (with the *finger* he means, not the *bow*) by reaſon of the ſtrong motion communicated to its *parts* (and happily divided there, which perhaps may be the cauſe too, why, if you ſtrike it with the *bow* in 2, it ſends forth forth a ſcreaking broken ſound) *BC* will tremble, but with a motion nothing ſo *brisk*, as when touched with but half the *force* any where elſe.

Prop. 4. *If the leſſer of two Fifths*, CD Fig. 8. *be touched on either of its halves* C2. 2D, *each third part of the greater* D X, XZ, ZE, *will anſwer it, but if in the middle* 2 *they will not ſtir.* Which will plainly appear,

By laying *papers* as before, on *t*, *x*, 3, *z*, *v*, if then you ſtrike *CD* on *C2* or 2*D*, you'l ſee the *papers* on *t*, 3, *v*, friſk and daunce, while thoſe on x and z ſtand ſtill, but if you ſtrike it on 2 none will move. *Demonſtratio eadem eſt cum ſuperioribus*, for *C2*. 2*D* are *Uniſons*, and *CD* an *Octave*, to *DX*, *XZ*, *ZE*, *per Princ.* 2.

If it be demanded, wherefore *DZ* or *XE* (which are *Uniſons* to *CD per Princip.* 2.) do not *vibrate* when it is touched in 2. He anſwers, if *DZ*, then by the ſame reaſon *XE* alſo, and ſo *XZ* would at the ſame time be moved by contrary motions, as in *Fig.* 16. *Q. E. A.*

Prop. 5. *If the greater of two fifths* DE *be touched*, Fig. 8. *on either of its thirds DX, XZ, ZE, each half of the leſſer C2. 2D, will anſwer it: but if in the diviſions XZ, they will not ſtir.*

Experimentum & demonſtratio inſtituuntur ut ſupra, *DX*, *XZ*, *ZE*, being *Uniſons* to *C2*. 2*D*, and *octaves* to *CD*, *per Princip.* 2.

If it be askt, why, when *DE* is toucht on *X* or *Z*, whereby the conterminous parts ſeem principally to be moved, *CD* does not *vibrate*, which is *Uniſon* to it. He anſwers, that if all *CD* could tremble, then beating the *Air* back again on *DE*, it would at once ſhake *DZ* and *XE* (*Uniſons* to *CD*) as in the former *Propoſ. Q.E.A.*

Prop. 6. *If the leſſer of two twelfths* IK, Fig. 12. *be touched, each third part of the greater*, K a, a b, b L, *will move*; *but in the diviſions*, a b *ſtand ſtill.* On the contrary, *if the greater be touched on its parts*, K a, a b, b L, *all the leſs will tremble*; *but if on the diviſions* a b, *it will not ſtir.*

Experimentum & Demonſtratio ut ante, IK being a *Uniſon* to K a, a b, b L, *per Princip.* 2.

Prop. 7. *If the leſſer of two fifteenths*, MN Fig. 13. *be touched, the greater will move in all its quarters* N c, c 4, 4 d, d O, *but not in their diviſions*, c 4 d. On the contrary, *if the greater be touched on either of its quarters* N c, c 4, 4 d, d O, *all the leſs will move*; *but if on the diviſions* c 4 d, *it will ſtand ſtill.*

Experimentum & demonſtratio inſtituuntur ut ſupra. MN being *Uniſon* to *Nc*, *c4*, *4 d*, *d O*, *per Princip.* 2.

207. Thus having cleared the late obſerved *Phænomena* mentioned above in §. 199. he infers the following *Corollaries*.

1. That all *Conſonancy* (or *Sympathetick* motion of *ſtrings*) is made by *Uniſons*, that is, 1 moves 1, and not 1. 2, or 2.3, *&c.* as appears from the fore-going *Propoſitions*. Hence
2. That each *ſtring* at the due touch of another, will tremble in as many places as it contains *Uniſons* thereunto, whether to the *whole* or its *parts*. So a lower *octave* in 2, each half being *Uniſon* to the higher; a lower *fifth* in three, and the higher in two, they being as 3 *Uniſons* to 2, *&c.* Hence
3. That all tuned *ſtrings* whatever (whether *thirds*, *fourths*, *fifths*, *ſixths*, *&c.*) will anſwer each other more or leſs, at the due touch of their *Correſpondents*: But the *tremor* or *vibration* in ſome of them being made in many places at the ſame time (according to the number of the *Uniſons*, *per Corol.* 2.) and therefore not great, where the part moved is but ſhort (*per Caſ.* 1. *Hyp.* 2. *Princ.* 1.) it cannot always be diſcerned by the

by the *ſenſe*, but follows by a parity of *reaſon*; contrary to what *Des Cartes*[p] aſſerts, that ſuch vibrations are found only in upper *thirds* and *fifths*.

208. From the ſame *Principles* may be ſhewn how a *Man* may ſtrike any two *Notes* with his *mouth* at the ſame time. For if a *Man* open his *mouth* in two places at once, as *AB* to *BC*, *Fig.* 17. or as 1 to 2 both in *length* and *bredth*, and then force out the *breath* ſtrongly againſt them (thus opened) ſo that the ſound be all begotten there (as in *whiſtling*) you will hear diſtinct and perfect *octaves*, *per Princ.* 2. And ſo ſecondly, if a *Man* can open his *lips* as *BC* to *CD*, *Fig.* 18. or as 2 to 3 in *length* & *bredth*, and do as before, he will ſtrike *fifths*, *per Princip.* 2. And after the ſame manner for the reſt of the *Notes*, according to the diviſion of the *Monochord*.

209. According to which *Hypotheſis* one *Hooper* here of *Oxford* could ſo cloſe his *lips*, as to ſing an *octave* at the ſame time. And I know two other perſons now living here, that can do it though their lips ſeem not to be ſet in that poſture, yet they ſhut them ſo cloſe that they can by no means pronounce any thing *articulate*. But *he* that excels them all, and indeed to a miracle, is one Mr. *Joſhuah Dring*, a young Gentleman of *Hart-hall*, who ſings a Song *articulatly*, *ore patulo*, and all in *octaves* ſo very ſtrongly, & yet without much ſtraining, that he equals if not excels the loudeſt *Organ*.

210. By what means he performs this, is hard to gueſs, unleſs the *Epiglottis* and *Uvula* be both concerned in it, one ſounding the *upper*, and the other the *lower octave*: or either of them apart, opening unequally as 1 to 2 in *Fig.* 17. or which is moſt likely of the *three*, by an unequal application of the *Uvula* to the *Epiglottis*. For his own part he can give but little account of it *himſelf*, only that he performs it in the lower part of his *throat*, and that it came caſually on him at firſt, upon *ſtraining* his *voice*; yet muſt it not be reckoned a meer *caſualty* neither, for he ſings theſe *octaves*, or otherwiſe (and both very ſtrongly) according to pleaſure. And this is all I know of new, concerning the *Mathematicks*, except there be any thing of *Chorography* in the *Map* of *Oxford-ſhire* prefixt to this *Eſſay*, that may be thought worthy the name of a *new Contrivance*.

211. In *Natural Philoſophy*, *Medicine* and *Anatomy*, there have alſo been many new *Inventions* and *Improvements*, made of later years in this *Univerſity*, which as they *promiſcuouſly* fell out in order

[p] *Muſicæ Compend. p.* 9.

of *time*, immediatly follow. The Honorable and Ingenious *Robert Dudley* Esq; formerly of *Christ Church* aforementioned, titular Duke of *Northumberland*, was the first *Inventor* of the *Pulvis Cornachinus*, being a mixture of *Diagridium*, *Tartar*, and *Diaphoretic Antimony*, with *cream* of *Tartar*, the proportions varying *pro re natâ*[q]; a *Medicine* of such general and excellent use, that *Marcus Cornachinus* (from whom it has its name) wrot a whole Treatise concerning it, commending it to the World as highly useful in all Diseases whatever, requiring *Purgation*.

212. Nor doubt I in the least, notwithstanding the pretensions of the famous *Thomas Bartholin*, and *Olaus Rudbeck*, but that the ingenious Mr. *Jolliff* of this *University*, first of *Wadham*, and after of *Pembroke College*, was the first *Inventor* of that fourth sort of *Vessels*, plainly differing from the *Veins*, *Arteries*, and *Nerves*, now commonly called the *Lymphaducts*: That he knew them about the beginning of *June*, *An.* 1652. we have the testimony of the learned and famous Dr. *Glisson*, to whom he discovered them, coming to *Cambridge* to take his *Doctors* degree[r]; at what time, says the Learned Dr. *Walter Charleton*, 'tis plain from *Bartholins* own Book set forth in *May*, 1653. that he scarce ever dreamt of them[s].

213. Yet I know the Learned *Bartholin*, amongst his *Anatomical Histories*, tells us he first found them the 15th of *Decemb.* 1651. and again, the 9th of *January*, and 28 of *Febr.* 1652[t]. and that the Learned *Olaus Rudbeck* says, He first discovered them in *October* and *November*, 1650[u]. both anticipating the date of Dr. *Glisson*. But I have been frequently told by my worthy and learned Friend, Dr. *Robert Stapley*, an eminent *Physitian*, and one of unquestionable fidelity, Contemporary with Mr. *Jolliff* at *Pembroke College* till *Oxford* was made a Garrison for the *King*, about the Year 1642. that they were often shewn to him by the same Mr. *Jolliff* while they were Students there. To which add the Testimony of the fore-cited Dr. *Charleton*, that these *Vessels* were known & commonly talked of amongst the *Fellows* and *Candidats* of the Famous *College* of *Physitians* in *London*, many years before they heard any news of them from beyond *Sea*[w]. Not to mention that Dr. *Highmore* seems to have noted something of them, though veiled under a different *name* and *description*.

[q] *Vid.* Jo Schroderi *Pharmacop. Medico-Chym. lib.* 2. *cap.* 77. [r] Fran. Glissonii *Anatom. Hepatis, cap.* 31. [s] Gualt. Charletoni *OEconom. Animal. Exercit.* 9. [t] Tho. Bartholini *Historiar. Anatom. Rar. Cent.* 2. *Hist.* 48. [u] Rudbeckii *Epist. ad* Bartholin. *de Vasis Serosis, p.* 11. [w] *Idem loco citato. Vid. etiam Epist.* Timoth. Clark, *M.D.* Philosoph. Transact. *Numb.* 35.

214. The

214. The ſame Learned Dr. *Highmore*, formerly of *Trinity College Oxon.* was the firſt that we know of that treated of the ſtructure of *Mans* body, adapting it to the then new received Doctrine of the *circulation* of the *Blood*; for the proof whereof he ſeems chiefly to have intended his piece of *Anatomy*, dedicating it to the *Author* of the *Invention*, the famous Dr. *Harvey*: Wherein he has ſeveral new *Cuts* of the *Spleen*, *Pancreas*, *Teſtes*, *&c.* of which, though moſt have ſince received conſiderable *Improvements* from *others*, yet it muſt be acknowledged that he deſerved very well for his diligent and laborious ſearch into them all, but more particularly for his firſt *diſcovery* of the new *ductus* for the carriage of the *ſeed* from the *Teſtes* to the *Paraſtatæ* [x], and for his new deſcriptions of the *Veſſels* and *Fibres* of the *Spleen*, by the ancient *Anatomiſts* held to be *Veins* [y], and of the intricate *plexus* of the *Paraſtatæ*, *&c* [z].

215. In *Natural Philoſophy*, the famous Dr. *Willis* of *Chriſt Church* College *Oxon.* and *Sidleyan* Profeſſor of *Natural Philoſophy* in this *Univerſity*, firſt taught us, that the *Generations*, *Perfections*, and *Corruptions* of *Natural Bodies*, whether *Mineral*, *Vegetable*, or *Animal*; and ſo likewiſe of *Bodies Artificial*, do depend upon *fermentations*, raiſed from the different proportions and motions of *Spirit*, *Sulphur*, *Salt*, *Water*, and *Earth*, which he has conſtituted the ultimate ſenſible *principles* of *mixed bodies* [a]. According to which, in his Book *de Febribus*, he has given us the *Anatomy* of *Blood*, and declared the true cauſes and nature of *fermentations* in the *Juices*, and upon them built his moſt rational Doctrine of *Fevers*, *intermittent*, *putrid* and *malignant*, with particular inſtances and obſervations concerning them, much different from the ways of the *Ancients*: to which he has ſuperadded the *Spagyrical Anatomy* of *Urin*.

216. In *Anatomy* (wherein he had the aſſiſtance of the deſervedly famous, Sir *Chriſtopher Wren*, Dr. *Millington*, Dr. *Edmund King*, Dr. *Maſters*, but chiefly of Dr. *Lower*) his *method* of diſſecting the *Brain* is new, and moſt *natural*; and ſo exact, that there is ſcarce any one part in it, but what has received conſiderable *advancements* from him. To mention all would be endleſs, let it therefore ſuffice, that after his deſcription of the *Palace* in

[x] *Corp. Human. diſquiſit. Anatom. Lib.* 1. *part.* 4. *cap.* 2. [y] *Ibid. part.* 3. *cap.* 3. [z] *Ibid. part.* 4. *cap.* 2.
[a] *In Libro de Ferment.*

general,

general, he has allotted the ſeveral appartments to the *faculties* of the *ſenſitive Soul*: His placing the *Spirits* to ſerve to voluntary actions in the *Cerebrum*, and thoſe that ſerve *Involuntary* in the *Cerebellum*, is a noble and uſeful *diſcovery*.

217. His aſſigning the *cortical* part for generating *Spirits*, and the ſeat of *Memory*; the *Medullary*, or *Corpus calloſum*, for the operations of the *Phantaſie*; the *Corpus ſtriatum* for the *common ſenſe*; the *Medulla oblongata*, a *promptuary* for the *Spirits*, for performing the office of *Senſation*, and *ſpontaneous* motion; and the *Prominentiæ orbiculares*, and their *Epiphyſes*, for conveying the *impreſſes* of the *paſſions*, and *natural inſtinct*, between the *Cerebrum* and the *Cerebellum*, are highly ingenious and his own; and ſo is his, and Dr. *Lowers* joint diſcovery of the curious *plexus*, of the *Vertebral* and *ſpinal Veins and Arteries*; their *Neurologia* is alſo moſt elaborate and no leſs admirable, tracing the *Nerves* from their very ſource, and following them through all the *Meanders* of the Body, and thence ſhewing us the reaſon of the ſecret *ſympathies* of the parts.

218. And although Dr. *Willis* was not the firſt that mention'd two *Souls* in a Man, *viz.* the *Senſitive* and *Rational*; yet there is no body has proved it ſo well as himſelf; as likewiſe that the *ſenſitive* is *igneous*; and that there are two parts of it, the *flammea* and *lucida*: Where he diſcourſes of the manner how the *Soul* performs its *operations* in us; he does it, as indeed he has done all, with the greateſt *Improvements* within the compaſs of *Wit* and *Reaſon*: And having fully diſcovered the *Hypoſtaſis* of the *ſenſitive Soul*, its *affections* and *ſenſes*; he further obliges *Mankind* with a moſt rational account of the *diſeaſes* ſeated in it, and the *Nervous Juice*, according to the different parts of the *Brain*, and the *Syſtema nervoſum*; placing *Cephalalgies* in the *Meninges*; *Lethargies*, *ſomnolentia continua*, *Coma*, *Carus*, *Pervigilium*, and *Coma vigil*, in the *Anfractus* and *Cortical* part of the *Brain*; the *Incubus* in the *Cerebellum*: Then deſcending to the *Corpus calloſum*, he finds the *Spirits* there ſomtimes hurled round into *Vertigo's*, ſomtimes exploded in *Spaſms*, *Convulſions*, *Epilepſies*, ſomtimes eclypſed in *Apoplexies*.

219. In the *Corpora ſtriata*, and *Medulla oblongata*, if the *ſpirits* that ſerve to *motion* be diſturbed, thence he ſhews come likewiſe *Spaſms* and *Convulſions*; if thoſe that ſerve to *ſenſation*, *dolor*; if either, or both, are impeded or deſtroyed, the *Palſie*: And

And as the *ſenſitive Soul* is the ſeat and organ of the *Rational*, ſo the ill conſtitution of *that* (he obſerves) proves oftentimes the diſorder of the *other*: For the *Animal ſpirits* being *ſpirituo-ſaline*, if they are *inflamed*, they produce a *Phrenſie*; if *acid*, *Melancholy*; if *acrous*, like *Aqua ſtygia*, *Madneſs*; if *vapid*, *Stupidity*. In diſcourſing of which diſtempers, his *Ætiologies* of the various *ſymptoms*, his *methods* of *cure*, and forms of *preſcriptions*, are founded upon far more rational *principles*, than ever *Greece* taught us. And how far *Antiquity*, and later *Ages* too, were miſtaken in their *notions* of divers other *diſeaſes*; his evincing *Hyſterical* and *Hypochondriacal affections*, the *Colic*, *Gout*, *Scurvy*, ſome ſort of *Aſthma's*, the *Tympanitis*, with *others*; either wholly, or in part to be *Nervous*, does plainly demonſtrate.

220. Nor has the *Pathological* part of *Phyſick* been only happy in his *labors*; but the *Pharmaceutical* part likewiſe highly improved in the *Inventions* of his *Spiritus Salis Armoniaci ſuccinatus*, *Syrup* of *Sulphur*, *preparation* of *Steel* without *Acids*, and from thence of his *artificial Acidulæ*: In general, this part of *Phyſick* has been ſo far advanced by *him*, that what was formerly *Empirical*, and but lucky hits, is now become moſt rational, by his making the *operations* of *Chathartic*, *Emetic*, *Diaphoretic*, *Cardiac*, and *Opiat Medicines*, intelligible by *Mechanical Explications*; having ſubjoined to each moſt neat and artificial *Formula's*, as well *Chymical* as *others*; a *Province* but meanly adorned by the *Ancients*, though of infinite uſe. And where Nature is exorbitant in any of theſe *Evacuations*, he has likewiſe taught us how to check and reduce *her*; adding for the better illuſtration of the whole, a new *Anatomy* of the *Stomach*, *Inteſtines*, *Gula*, *Veins*, and *Arteries*.

221. Which he has ſeconded with a further diſcovery and rational account of *Thoracic* and *Epatic Medicines*, and of the *Diſeaſes* belonging to thoſe *parts*; diſcourſing alſo of *Veneſection*, ſtopping of *Hemorraghies*, of *Iſſues* and *cutaneous Diſtempers*: In all which it may be obſerved, what is almoſt peculiar to him; that there is nothing *trivial*, moſt *new*, and all moſt *ingenious*. To which add, that the *organs* of *Reſpiration*, which have been the *ſubject* of ſo many Learned Pens of late, are beſt underſtood, from his moſt elegant *deſcriptions*, and beautiful *Cuts*. But it is too difficult a task to give a juſt account how far *Phyſick*, *Anatomy*, *Chymiſtry*, and *Philoſophy*, ſtand indebted to *him* for their *Improvements*.

ments. Let it ſuffice to ſay, that he has introduced a new *Body* of *Phyſick*, almoſt univerſally embraced before all *others*, and a new *Sect* of *Philoſophers* at home and abroad called *Williſians*; ſo that *England* (for ought I know) may have as much reaſon to boaſt of her Learned *Willis*, as *Coos*, and *Pergamus* of old, of their great *Maſters* in *Phyſick*.

222. The Learned and Ingenious Sir *Chriſtopher Wren*, *Sivilian* Profeſſor of *Aſtronomy* in this *Univerſity*, was the firſt *Author* of that noble *Experiment* of injecting Liquors into the *Veins* of *Animals*, firſt exhibited to the meetings at *Oxford*, about the Year 1656 [b]. and thence carryed by ſome *Germans* and publiſhed abroad; by which *operation* divers *Animals* were immediatly *purged*, *vomited*, *intoxicated*, *kill'd* or *revived*, according to the quality of the *Liquor* injected [c], whereof we have ſeveral *Inſtances* in our *Philoſophical Tranſactions* of *Decemb.* 4. 1665 [d]. From whence aroſe many other new *Experiments*.

223. Particularly that of *transfuſing* of *Blood* out of one *Animal* into another, firſt performed here at *Oxford* about the latter end of *February*, in the Year 1665 [e]. by that moſt exquiſite *Anatomiſt*, and eminent *Phyſitian*, Dr. *Richard Lower* Student of *Chriſt Church*; the *method* whereof I ſhall not here mention, nor the conſiderations upon it, becauſe there is a particular account of both already given by the Learned *Inventor*, in his fore-cited Book *de Corde*, *&c.* and in our *Philoſophical Tranſactions* [f]. Nor how much the famous *Willis* was beholding to *him* for moſt of his *Anatomical Diſcoveries*, becauſe already freely acknowledged by the Doctor *himſelf*, in the *Preface* to his Book *de Cerebro*.

224. Wherefore paſſing by thoſe, I ſhall only hint in ſhort what I meet with new in Dr. *Lowers* Book *de Corde*, a ſubject though handled by many Learned Men, yet not ſo far exhauſted, but it afforded new *diſcoveries*, when it came to be examined by this moſt curious, moſt judicious *Author*. For though the *Heart* by *Hippocrates* was called *μῦς*, yet Dr. *Lower* was the firſt that publiſhed the true *method* of dividing it into its ſeveral *Muſcles*, illuſtrating the ſame with moſt elegant *Cuts*; and by attributing to it a *muſcular* motion, and ſhewing ſeveral ways how it may be impeded or di-

[b] *Vid. Epiſtol.* Timoth. Clarck, *M. D.* Philoſoph. Tranſact. *Numb.* 35. [c] Hiſtory of the Royal Society, *Part.* 2. *ſub finem.* [d] Philoſoph. Tranſact. *Numb* 7. [e] *Vid. Tractat. de Corde, &c. cap.* 4. *de tranſfuſione Sanguinis.* [f] Philoſoph. Tranſact. *Numb.* 20.

ſturbed,

ſturbed, has done a good piece of ſervice toward the advancement of the *Pathological* part of *Phyſick*.

225. His computation of the frequency of the Bloods *circulation* through the *heart*, is very ingenious, and the cauſe he aſſigns of the *florid colour* of it when emitted, I think is *new*, and believe generally received: And having diſcovered the *Channels* that carry away the *Serum* that is ſeparated by the *Glandules* of the *Brain*, to be thoſe two *foramina* in the *Os Cuneiforme*, which empty it into the *Jugular Veins*, he has ſufficiently detected how far the *Ancients* were miſtaken, in making the *cauſes* of ſeveral *diſtempers* to be *defluxions* or *humors* falling from the *Brain*; which paſſage of the *ſecreted* humors into the *Jugular Veins*, is indeed mention'd alſo by Dr. *Willis*, but ſuppoſed by moſt to be Dr. *Lowers* Invention.

226. The Ingenious *John Mayow* L. L. D. and Fellow of *All-Souls College*, but Student in *Phyſick*, has lately alſo taught us that the *Air* is impregnated with a *Nitro-aerial Spirit*, and that it is diffuſed almoſt through the whole *Syſtem* of *Nature*; that *Fire* it ſelf, as to its form and eſſence, is nothing elſe but this *Nitro-aerial Spirit* put into motion, and that all *Fermentations*, whether tending to *generation*, *perfection*, or *corruption*, alſo depend on this *Spirit*, with many other *Phænomena* of *Nature*; all which he has ingeniouſly deduced from his *Nitro-aerial principles*, and confirmed them by *Experiments*.

227. He has taught us alſo in his *Treatiſe de Motu muſculari*, that whereas *Anatomiſts* have hitherto perſwaded us, that the *carneous Fibres* chiefly make the *contraction* in *Muſcles*, that it is much more probable that the *Fibrillæ*, tranſverſly ſet into the greater *Fibres*, are the immediate *inſtruments* of that *motion*, by reaſon as well of their poſition as cize and number. And he has given the beſt account that I have any where met with, of the reaſon of the *Incurvation* of the *Leg-bones* and *Spina dorſi*, in the diſeaſe called the *Rickets*.

228. Laſtly, the ingenious *Edward Tyſon* M. A. of *Magdalen Hall*, and Student in *Phyſick*, has lately obſerved, that many other ſtrong ſcented *Animals*, beſide the *Hyæna odorifera*, *Catus Zibethicus*, or Civet-cat; the *Fiber* [*Caſtor*] or Bever, from whom we have our *Caſtoreum*; the *Gazella Indica* or *Capra Moſchi*, from whom our *Musk*; and the Fiſhes, *Sepia*, *Loligo*, *Purpura*, have *follicular*

licular Repoſitories or *Bags*, near the *exit* of the *Inteſtinum rectum*, wherein they keep thoſe *humors* or *liquors*, that are the *Vehicles* of their reſpective *ſcents*.

229. This he firſt obſerved in a male *Pol-cat* he diſſected here at *Oxford*, *Febr.* 4. 1674. and was further confirmed therein the ſecond of *March* in the year following, 1675. in a female *Pol-cat*, at the opening whereof I was preſent my ſelf; ſince which times, he has found the ſame in a *Fox* diſſected in the preſence of Dr. *Grew*; and ſince again in *Weaſels*, *Cats*, *&c.* the *veſicles* or little *bags* being found by *pairs*, one on each ſide the *gut*; and according to the bigneſs of the *Animals*, largeſt in the *Fox*, and leaſt in the *Weaſel*.

230. Thoſe of the *Pol-cat* were about the bigneſs of *Peas*, of a ſomwhat oblong *figure*, and a yellowiſh *colour*, and ſeemed to conſiſt of a double ſubſtance, *glandulous* and *membranous*; the *membranous* toward the necks of the *bags* being cover'd with *glandules*, but toward the *fundus* wholly *membranous*, repreſenting upon being emptied, *orbicular muſcular Fibres*, which he ſuppoſes by *contraction* force the contained *humor* out into the *gut*.

231. The uſe of the *Glandules* he doubts not to be, to ſeperate the *humor* from the maſs of *blood* (all *ſecretions* in the Body being performed by the help of *Glandules*) and the necks of the *bags* immediatly emptying themſelves into the *gut*, without any continued *ductus*; and being placed near the *Sphincter Ani*, made him think the contained *humor* in reſpect of the *Animal*, to be *excrementitious*. In this *Pol-cat* it was of ſomwhat a thick *conſiſtence*, for the moſt part *white*, but in ſome places of a *greeniſh yellow* colour, and upon preſſing out, of ſo ſtrong a *ſcent*, that I could ſcarce (I well remember) endure the *room*; which once removed from the *body*, we could not perceive any conſiderable ill *ſmell* in any of the other *parts*.

232. In a *Cat* that he diſſected (which was but a young one, and a *female*) the *bags* when blown up were not above the *cize* of ordinary *Peas*, ſeated like the former on both ſides the *inteſtinum rectum*, juſt under the *Sphincter Ani*, which covering them, he ſuppoſes might both occaſion their not being noted before, and help in the expreſſion of the *humor* out, which (he obſerved in the *Cat*) was not into the *gut*, but in the *limb* or *margo Ani*, the orifices of the *bags* terminating there, ſo that he plainly perceived them

before

before he began to diſſect her: The *Glandules* that ſeperate the *humor* from the maſs of *Blood*, and tranſmitted it into the *bags*, afforded a pleaſant ſight, there being ſeven ſmall round *ones* placed in a *circle* about the *veſicles*, the *humor* within not being conſiderable but for the *fætor*.

233. Such *Glandules* (which he thinks hold the nature of *Emunctories*) he has likewiſe obſerved in *Rabbits*, but with no conſiderable *cavity*, the *liquor* whereof he rationally gueſſes may give the *ranck taſt* we find about thoſe *parts* after they are roaſted: He thinks alſo ſuch like *Glandules* are found in *Mice* and *Rats*, and obſerves that in ſome *Animals* they are found more *glandulous*, in others with a more ſignal *bag* or *cavity*. And *analogous* to theſe *ſcent-bags* in *Quadrupeds*, he believes thoſe *Glandules* ſeated on the *rumps* of *Fowls*, whoſe *excretory veſſels* may be thoſe little *protuberances* or *pipes* we obſerve on them; whence 'tis alſo (as in *Rabbits*) that we find the *rumps* of *Fowls* ſtrongeſt taſted, and to partake moſt of the *natural ſcent* of the *Fowl*.

234. That all *Animals* conſerve their peculiar *ſcents* in ſuch like *parts*, though he dares not aſſert; yet if the *analogy* that *Nature* obſerves in forming moſt of the *parts*, of moſt *Animals* alike, be ſufficient *Logick* to warrant an inference, he thinks it highly probable that 'tis ſo in *moſt*; and that ſhould they be found in *Man* (which he has not yet had opportunity to Experiment) it might be worthy enquiry how far *Fiſtula's*, *Teneſme's*, *&c.* might be concern'd in *them*. Which is all I have met with new relating to this *County*, in *Medicine*, *Anatomy*, or *Natural Philoſophy*. For to mention the many and new *Experiments* of the Famous Mr. *Boyle* (did we diſtinctly know which were made *here*) would be endleſs, and to recapitulate the *New Diſcoveries* (if there be any in this *Eſſay*) but a vain repetition.

CHAP. X.

Of Antiquities.

AND thus having finiſh'd the *Natural Hiſtory* of *Oxfordſhire*, I had accordingly here put a period to my *Eſſay*, but meeting in my *Travels* with many conſiderable *Antiquities*, alſo relating to *Arts*, either wholly paſt by both by *Leland* and *Camden*, or but imperfectly mention'd; and finding that I may as well alſo note them in other *Counties* hereafter, as let them alone: I have been perſwaded to add (becauſe perhaps a *digreſſion* that may be acceptable to ſome) what I have met with in this *kind*, whether found under *ground*, or whereof there yet remain any foot-ſteps above *it*; ſuch as ancient *Mony*, *Ways*, *Barrows*, *Pavements*, *Urns*, ancient *Monuments* of ſtone, *Fortifications*, *&c.* whether of the ancient *Britans*, *Romans*, *Saxons*, *Danes*, *Normans*. Of which in their order,

2. Leaving the *Antiquities* and Foundations of *Churches* and *Religious Houſes*, their *Dedications*, *Patronages*, and foundation *Charters*; with the *pedigrees* and *deſcents* of *Families* and *Lands*, *&c.* as ſufficient matter for another *Hiſtorian*, and as too great a *task*, and too much beſide my deſign, for me to attempt. However, I have taken care in the *Map* prefix'd to this *Eſſay*, to put a *mark* for the ſite of all *Religious houſes*, as well as ancient *ways* and *Fortifications*, except *Brockeley* and *Saucomb*, both mention'd in the *Catalogues* of *Harpsfield*[g] and *Speed*[h], which I could not find out, though I ſought them diligently.

3. Of *Britiſh Antiquities* that are certainly ſuch, I have met with none here but ſome *pieces* of their *Mony*; whereof, as much as I find not *deſcribed* before, I have cauſed to be delineated, *Tab.* 15. *Fig.* 19, 20, 21. Of which the firſt no doubt is a Coin of King *Cunobelin*, a *King* here in *Britan* at the time of the *birth* of our *Saviour* CHRIST; it ſhewing a *Horſe*, and his *Inſcription* on one ſide, and an *Ear* of *Corn* and *CAMU* on the *reverſe*; intimating the place of its *coinage* to be *Camulodunum*, the Royal *City* and *ſeat* of *Cunobelin*.

[g] *Catalogus Ædium Religioſar. in fine Hiſt. Angl. Eccleſiaſt.* [h] Hiſtory of *Great Britan. lib.* 9. *cap.* 21. *ſub finem.*

4. *Camden*

4. *Camden*, 'tis true, has deſcribed a *Coin* of the ſame *King*, not differing in the *reverſe* at all from this; but the *Inſcription* of ours varies from his, in that the final *Letter* O, is not plac'd in a line with the reſt of the preceding *Letters* under the *Horſes* feet, but juſt before his *breaſt*; the *Horſe* having alſo a *ſpica* or ear of Corn (or ſome ſuch like thing) placed over his back, *Fig.* 19. which is not to be found in any of *his*. This was dug up at *Wood-Eaton* this preſent Year 1676. near the Houſe of the Worſhipful *John Nourſe* Eſq; amongſt old *Foundations*, and kindly beſtowed on me by the ſame worthy *Perſon*.

5. At the ſame time and place, the ſmall one next engraven, *Fig.* 20. was alſo dug up, but whether of the ſame *King* or no, does no where appear, it having nothing upon it but ſomwhat like a *Chalice*, and a crooked *lineation*, under which there is alſo a *forked* kind of *Figure*, and a ſmall *Creſcent*; unleſs the *affirmative* may be collected from the laſt of theſe, the *Creſcent* being to be met with on *Cunobelins* mony, as is plain from Mr. *Camden*, and ſo on the *mony* which he thinks carries the name of the *City Callena*, *alias Gallena*, now *Wallingford*[i]: Whereof though I can give no better account, I however thought fit to give a draught of it, becauſe poſſibly it may meet with a *Reader* that can.

6. But for the *third*, that ſeems adorned with two *faces* on the *obverſe*, and an ill ſhapen *Horſe* and a *wheel* underneath him on the *reverſe*, *Fig.* 21. dug up at *Little Milton*, now in the poſſeſſion of my Reverend and Learned *Friend*, Mr. *Obadiah Walker* the worthy *Maſter* of *Univerſity College*; I take, notwithſtanding the want of an *Inſcription*, to be a *coin* of *Praſutagus*, *King* of the *Iceni*, mention'd by *Tacitus*, who out of hopes of preſerving his *Kingdom* and *Houſe* quiet after his *death*, made the Emperor *Nero*, and his *two daughters*, Co-heirs of his Fortunes. And that the two *faces* are of him and his valiant Queen *Boodicia*[k], otherwiſe called by the ſame *Tacitus*, *Boudicea*[l], and *Voadica*[m], who in revenge of her own *daughters* ill uſage by the *Romans*, after the deceaſe of her *husband*, raiſed an Army againſt them, utterly vanquiſh'd the ninth *Legion*, ſack'd *Camulodunum* and *Verulam*, and ſlew no leſs then ſeventy thouſand of them[n].

7. And the ground of this conjecture, I take from the *reverſe*

[i] See *Camdens* general Hiſtory of *Britan.* [k] *Taciti Annalium, lib.* 14. *cap.* 31. [l] *Ibidem cap.* 35. [m] *In Libr. Tacit. de Julii Agricolæ vita, cap.* 16. [n] *Taciti Annalium, lib.* 14. *cap.* 33.

with

with the *Horſe* and *wheel* under him, moſt times found on the *Coins* of the ſame *Boodicia*, where her name is ſtamp'd on them, as may be ſeen both in Mr. *Camden* and Mr. *Speed*'s Hiſtories: by the *horſe* and *wheel* intimating perhaps their great ſtrength to lie in their *Eſſeda*, a ſort of *Chariot* much uſed by the *Britans* in War, as is teſtified by *Cæſar* [o], and particularly by *Tacitus* of this very *Boudicea*, *viz.* that ſhe was drawn in a *Chariot*, with her *daughters* placed before her [p], when ſhe came to fight *Suetonius* then *Proprætor* of *Britan.* Or elſe perhaps by this time having learned of the *Romans* the neceſſity and convenience of making *military ways*, and other paſſages for Carriages through the *Woods* and *mariſh* grounds; in memory of the fact, after the manner of the *Romans*, as may be ſeen on the mony of *Trajan*, *Hadrian* [r], *&c.* they might put theſe *horſes* and *wheels* on their *Coin.*

8. Which is all I know remarkable in theſe *Britiſh pieces*, but that they are all hollowed to a *concave* on one ſide, and *convex* on the other (a concomitant of moſt, if not all *Britiſh coin*) and that they are all *gold*, or at leaſt *Electrum*, as moſt of the *Britiſh mony* we now find is, which is a ſort of *metal* compounded of *gold* and *ſilver*, and this done either by *nature*, or proportioned by the *Artiſt.* That there is ſuch a *metal* as *natural Electrum*, we have not only the teſtimony of *Pliny* [s], who ſays, 'tis found commonly in trenches and pits. But of *Servius* [t], and St. *Iſidore* Biſhop of *Sevil*, the latter whereof aſſerts, that the *natural Electrum* is of great value, *Quod naturaliter invenitur in pretio habetur*, are his very words, for that it is more pure then any other *metal*, and that if poiſon be put into a veſſel made of it, it makes a hiſſing ſparkling noiſe (as *Pliny* alſo witneſſes) and caſts it ſelf into *ſemicircles*, reſembling *Rain-bows*, as well in colours as figure [u].

9. To which add the teſtimony of *Peter Martyr*, a perſon of unqueſtionable credit and veracity, who himſelf ſaw a great piece of pure *natural Electrum*, ſo heavy, that he was unable to move it one way or other, much leſs to lift it with both hands from the ground: they affirmed (ſaies he) that it weighed above 300 pounds, at eight ounces to the pound, and that it was found in

[o] *Jul Cæſaris Comment. de Bello Gallico, lib.* 4. [p] *Tacit. Annal. lib.* 14. *c.* 35. [r] *Vid. Ducis Croyiaci & Arſchotani Numiſmata, Tab.* 36 *& Levini Hulſii Imp. Rom. Numiſmatum ſeriem. in Hadriano.* [s] *Nat Hiſt. Lib.* 33. *c.* 4. [t] *Maur. Servii Honorat. Comment. in Pub. Virgilii, Æneid. lib.* 8. *ad v.* 204. [u] *Iſidori Epi. Hiſpalenſis, Originum lib.* 16. *cap.* 23.

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the Houſe of a certain Prince, and left him by his *Anceſtors*. And albeit, that in the days of the *Inhabitants* then living, it was no where digged, yet knew they where the *Mine* of it was, but were very unwilling to diſcover the place; yet at length they did, it being ruinated and ſtopt with ſtones and rubbiſh; being much eaſier to dig then *Iron mine*, and might be reſtored again, if *Miners*, and others ſkilful therein, were appointed to work it [w].

10. Some ſuch *natural Electrum* ſeems alſo to be hinted in the *Civil Law*, and to have been mixed with *Silver*. *Neratius* reporting that *Proculus* gave ſentence, that it was no matter in a Legacy of *Electrine veſſels*, how much *Silver* or *Electrum* was in them, but whether the *Silver* or *Electrum* exceeded? which might eaſily be perceived by ocular inſpection; or if ſo equally mixt that it could not be done, that then recourſe was to be had to the *Eſtimat* of the *Teſtator*, amongſt which ſort of *veſſels* he uſually accounted them [x]. Whence 'tis eaſie to collect, that the *Electrum* here ſpoke of, can be no artificial mixture of *ſilver* and *gold*, again mixed with *ſilver*; but a *natural metal* before it mixtion with *ſilver*.

11. Moreover, that there is alſo an *artificial Electrum*, is as evident from the *Inſtitutes* of the Emperor *Juſtinian* [y], and *Q. Flor. Tertullian* [z]: made by intermingling *gold* and *ſilver*, according to the natural mixture; which according to *Servius* and St. *Iſidore* [a], was of *gold* in a *triple*, but according to *Pliny* [b] and *Monſieur Savot* [c], in a *quadruple* proportion, to one of *ſilver*; *viz.* 19 *Carats* $\frac{1}{5}$ of *gold*, and 4 *Carats* and $\frac{4}{5}$ of *ſilver*; which as the ſame *Savot* teſtifies, were the proportions obſerved by the Emperor *Severus Alexander*, and *Lewis* the Twelfth of *France*, by an *Ordinance* made at *Blois*, of *Nov.* 19. 1506. for the *French* gold.

12. Which very proportions I ſhould be willing to think our *Britiſh coins* to have; only I gueſs the *Britans* had, and made uſe of, as little *Art* as might be: Wherefore I am enclined to believe them rather *native Electrum*, dug and coined thus according as they found it, either richer or poorer; for I have ſeen ſome pieces of this ſort of *mony*, much richer in *gold* then ſome others are. That *gold* and *ſilver Mines* were worked here in *Britan* in thoſe

[w] *Petri Martyris Anglerii de Orbe Novo, Decad.* 1. *cap.* 4. [x] ff. *De Auro Argento, &c. Leg. Pediculis*, §. *Neratius.* [y] *Inſtitut. de Rerum diviſione*, §. *Si duorum.* [z] *Q. Septimii Florent. Tertulliani Lib. adverſ. Hermog. cap.* 25. *& adverſus Praxean. cap.* 27. [a] *Locis ſupra citatis.* [b] *Loco citato.* [c] *Louis Savot de la Matiere des Medalles antiques*, 2 *part. chapitre* 9.

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ancienter days, is plain out of *Tacitus*: *Fert Britannia* (ſays he) *Aurum & Argentum, & alia metalla, pretium victoriæ* [d]. And Prince *Galgacus* chief Captain of the *Britans*, now beat Back as far as *Mount Grampius* in *Scotland*. in his ſpeech (before the fight with the *Proprætor Agricola*) exciting them to indignation againſt the *Romans*; amongſt other things tells them, that theſe were the *men* that had taken from them their fertile *Soil*, their *Mines*, and trading *Towns*: *Neque enim Arva nobis, aut metalla, aut Portus ſunt, quibus exercendis reſervemur* [e]. Now all *gold* whatever containing ſome *ſilver* more or leſs, and the *Britans* not being able to refine it then, as in after Ages, were neceſſitated to coin *Electrum* after this manner.

13. That they had and coined *ſilver* in theſe early times, is alſo plain from Mr. *Camden*, Mr. *Speed*, *&c.* who have given us draughts of *ſilver* Coins of *Cunobelin*, *Venutius* King of the *Brigantes*, and *Caractacus* King of the *Silures*, both which make not a little for the reputation of my conjecture §§ 62 and 63 of the ſixth *Chapter* of this *Eſſay*, the *Mines* there mention'd, in all probability, being ſome of thoſe ſpoken of by *Tacitus*, and perhaps firſt belonging to the *aboriginal Britans*, and after to the *Romans*.

14. To this if it be objected out of *Cæſars Commentaries*, that the *Britans* then uſed only *Copper* (and that imported) and *Iron rings* inſtead of *mony* [f]; and that this *gold* might either be alſo imported, or the *Mines* diſcover'd after the conqueſts of the *Romans*. It may rationally be anſwer'd, that *Cæſars* account of the State of *Britan* (as has been ſhewn alſo before in another caſe, *Chap.* 3. §. 2. of this *Eſſay*) is as imperfect as his *Victories* or *Travels* in it were. For we find in Mr. *Speed* a *gold coin* of King *Caſſivellaun*, who was King here in *Britan* at *Cæſars* arrival; beſide the *Romans* came then not to enrich, but to ſpoil *Britan*, how unlikely it is therefore they ſhould ſupply them with *gold*, or find them *Mines* ſo early, let the *Reader* judge.

15. Whereunto it may be added (as *Tacitus* informs us) that *Cæſar* rather diſcovered then conquered *Britan*; that he rather frightened the *Inhabitants* on the ſhoars, than got footing there: *Quanquam proſperâ pugnâ terruerit Incolas, ac littore potitus ſit, poteſt*

[d] *Tacitus in vita Julii Agricolæ, cap.* 12. [e] *Ibidem cap.* 31. [f] *Julii Cæſar. Comment. de Bello Gallico, lib.* 5.

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videri ostendisse posteris, non tradidisse [g], are his very words of him: And that whatever he pretended at *Rome*, he got little here but dry blows, and the honor of having led an *Army* hither, Μηδὲν μήτε ἐκ τῆς Βρεττανίας, μήτε ἑαυτῷ, μήτε τῇ πόλει προσκτησάμενος, πλὴν τῆ ἐστρατοπέδευσεν ἐπ αὐτῆς δόξαν, says *Dion Cassius* of his first *Expedition* [h]. And *Tacitus* rather more than less of his *second*, who brings in *Caractacus* encouraging his *British Army* to recover their Liberty; and in order thereunto, calling upon the names of their *Ancestors*, *Qui Dictatorem Cæsarem pepulissent*, that had driven the Dictator *Cæsar* out of the *Land* [i].

16. Add further hereunto what *Strabo* delivers concerning his *Expeditions* into *Britan*, Οὐδὲν μέγα διεπραξάμενος, οὐδὲ προελθὼν ἐπὶ πολὺ τῆς νήσου, that he did nothing *great*, nor went far up into the *Island* [k]. And that *Tacitus* further confesses him beaten hence: for speaking concerning the *arguments* the *Britans* used amongst themselves to perswade the *Revolt* under *Voadica*, he says they brought this as a main one, that could they shew but the courage of their *Ancestors*, *Recessuros* (*i. e. Romanos*) *ut Divus Julius recessisset* [l]: intimating, that his sudden departure hence was little better than a *flight*. Not to mention what *Quintilian* says of one *M. Aper*, that he met with an ancient *Britan*, that avowed to him, that he was in the *British Camp* when they beat *Cæsar* from the shore [m]; and that *Lucan* says of him expresly,

Territa quæsitis ostendit terga Britannis [n].

17. After whose departure, the *Britans*, says *Tacitus*, enjoyed a long Peace, lying forgotten by the *Romans* all the days of *Augustus*, *Tiberius*, and *Caligula* [o]; so unlikely were the *Romans* to help *Cassivellaun* or *Cunobelin* to this *Gold* or *Electrum*: Nor indeed is it probable they would do it after, in the time of *Claudius*, when they had footing here; not only for that *mony* and *riches* are the incentives to *rebellion*, and the very sinews of *war*, but because had they thought it fit either then or before, we should certainly have heard on't in some of their *writings*.

18. Of *Roman Antiquities* yet remaining in this *County*, (to wave the stories of *Molmutius* and *Belinę*) the most considerable of any, are their *publick ways*, whereof though there are several,

[g] *Tacitus in vita Julii Agricolæ, cap.* 13. [h] *Dionis Cassii, Rom. Hist. lib.* 39. [i] *Taciti Annalium, lib.* 12. *cap.* 34. [k] *Strabon. Geograph. lib.* 4. [l] *Tacitus in vita Agricolæ, cap.* 15. [m] *Fab. Quinctiliani de Oratoribus Dialog. cap.* 17. [n] *An. Lucani de Bello Civili, lib.* 2. *v.* 572. [o] *Tacitus in vita Agricolæ, cap.* 13.

and of different *forms* and *materials*, and thoſe too broken down, and diſcontinued by ploughing and other accidents; yet by their *pointing*, and after a diligent *ſcrutiny*, I hope I ſhall render at leaſt a probable account of them.

19. But before I deſcend to particulars, it will be neceſſary I think to acquaint the *Reader*, that of theſe amongſt the *Romans* ſome were called *publick*, κατ' ἐξοχήν, and others *Vicinal*[p]. And that the firſt ſort of theſe were otherwiſe called (as reckon'd up by *Taboetius*[q]) by theſe other different names, *Regiæ* (by the *Greeks* βασιλικαὶ) *Prætoriæ*, *Conſulares*, *Militares*, *Privilegiatæ*, *Illuſtres*, *frequentatæ*, *Celebres*, *Eximiæ*, &c. and after by the *Conqueror William*, in the Laws he confirmed of St. *Edwards*, *Chemini majores*, from the French *Chemin*, as may be ſeen by the Laws of the ſame King *Edward*[r]: of which ſort we had in all but four in *England*; *Watling-ſtreet*, the *Foſs*, *Ikenild-ſtreet*, and *Erming-ſtreet*; whereof two ſtretched themſelves from *Sea* to *Sea* the *length* of the *Land*, and the two other the *bredth*; all miſdemeanors committed in theſe, falling under the cognizance of the *King* himſelf. *Pax autem quatuor Cheminorum* (*intellige majorum*) *ſub majori judicio continetur*[s]?

20. Beſide theſe, there were many others of like *erection*, though of leſs extent, by the ancient *Romans* called *Vicinales*, *quod in vicos ducebant*, *i. e.* from *Colony* to *Colony*, from *Station* to *ſtation*; which were alſo *publick*, if compared with the more *private Agrarian ways*[t]. And theſe were after by King *William* called *Chemini minores*, and were the ways (as expreſly deſcribed in the *Laws* of St. *Edward the Confeſſor*) *de Civitate ad Civitatem*, *de Burgis ad Burgos*, *ducentes*, *per quos Mercata vehuntur*, *& cetera negotia fiunt*, &c. all miſdemeanors committed in theſe, falling under the cognizance of the *Earl*, or chief military *Governor* of the *County*, or of his *Vice-Comes* or *Sheriff*.

21. It will alſo be expedient to inform the *Reader*, that both the *Majores* and *Minores* were ſomtimes *raiſed*, and ſomtimes *level* with the ground[u], and ſomtimes *trenched*; and the *raiſed ones* ſomtimes only of *earth*, and ſomtimes *paved*[w], eſpecially in moiſt and boggy grounds; though it muſt alſo be acknowledged that

[p] ff. *Ne quid in loco publ vel Itinere fiat. L. Prætor ait*, §. *viarum*. [q] *Julius Taboet. in Ephemerid. Hiſtor.* [r] Αρχαιονομια *Gul. Lambard. inter L. L. boni Regis Edoard.* LL. 12, 13. [s] *Ibidem*. [t] ff. *Ne quid in loco*, &c. *L.* & §. *quibus ſupra*. [u] *Nich. Bergier Hiſtoire des grands Chemins de L'Empire*, *Liv.* 2. *chapitre* 17. [w] *Ibid. Chapitre* 7.

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we ſomtimes find them *paved*, where there was little need: which I gueſs might be done to exerciſe the *Soldiers* and *common people* of the *Country*, leaſt by lying idle they ſhould have grown mutinous, and affected alterations in the State. But where they were indeed laid through *meers* and low places, and neceſſity compelled them to raiſe and *pave* them, we have the exact method of making them, laid us down by *Statius* [x].

Hic primus labor inchoare Sulcos,
Et reſcindere limites, & alto
Egeſtu penitus cavare terras:
Mox hauſtas aliter replere foſſas
Et ſummo gremium parare dorſo,
Ne nutent Sola, ne maligna ſedes
Et preſſis dubium Cubile ſaxis.

i. e. that they firſt laid out the *bounds*, then dug *trenches*, removing the *falſe* earth: then filled them with *ſound* earth, and paved them with *ſtone*, that they might not ſink or otherwiſe fail.

22. Of the four *Baſilical*, *Conſular*, or *Prætorian ways*, or *Chemini majores*, I have met with but one that paſſeth through this *County*, the diſcovery whereof yet I hope may prove acceptable, becauſe not deſcribed before, or its footſteps any where noted by Sir *H. Spelman*, Mr. *Camden*, or any other *Author* that I have read or could hear of: whereat indeed I cannot but very much wonder, ſince it is called by its old name at very many places [*Ikenild way*] to this very day. Some indeed call it *Icknil*, ſome *Acknil*, others *Hackney*, and ſome again *Hackington*, but all intend the very ſame *way*, that ſtretches it ſelf in this *County* from North-eaſt to South-weſt; coming into it (out of *Bucks*) at the Pariſh of *Chinner*, and going out again over the *Thames* (into *Berks*) at the Pariſh of *Goreing*, lying within the *County* in manner and form, and bearing to the *Pariſhes* and *Villages* placed on each hand, as deſcribed in the *Map* prefixed to this *Eſſay*, by two ſhaded parallel lines made up of *points*, which I have choſe, to ſhew that this way is not caſt up in a ridged bank, or laid out by a deep trench, as ſome others are; deſcribed alſo in the *Map* by two continued parallel *lines*, that the *Reader*, or ſuch as pleaſe to view them hereafter, may know where to expect a *bank* or *trench*, and where no ſuch matter.

[x] *Papin. Surc. Statii Silvar. Lib. 4. in via Domitian.*

23. The reaſon, I ſuppoſe, why this *way* was not raiſed, is, becauſe it lies along under the *Chiltern* hills on a firm faſt ground, having the Hills themſelves as a ſufficient direction: Which is all worth notice of it, but that it paſſes through no *Town* or *Village* in the *County*, but only *Goreing*; nor does it (as I hear) ſcarce any where elſe, for which reaſon 'tis much uſed by ſtealers of Cattle: and ſecondly, that it ſeems by its *pointing* to come from *Norfolk* and *Suffolk*, formerly the Kingdom of the *Iceni*, from whom moſt agree (and perhaps rightly enough) it received its name *Icenild*, or *Ikenild*; and to tend the other way Weſt-ward, perhaps into *Devon-ſhire* and *Cornwall*, to the *Lands* end. So much miſtaken is Mr. *Holinſhed* in his deſcription of this way [y], who fanſied it began ſomwhere in the *South*, and ſo held on toward *Cirneceſter*, and thence to *Worceſter*, *Wicomb*, *Brimicham*, *Lichfield*, *Darby*, *Cheſterfield*, and croſſing *Watling-ſtreet* ſomwhere in *York-ſhire*, ſtretched forth in the end to the mouth of the *Tine* at the main *Sea*. Yet the Learned Mr. *Dugdale* [z] ſeeming to favor this opinion in his deſcription of *Ickle-ſtreet* that paſſes through *Warwick-ſhire*, I ſuſpend my judgement till I have ſeen more of both.

24. Amongſt the many *Vicinal ways*, or *Chemini minores*, we have but one neither here, of all thoſe mentioned by *Antoninus* in his *Itinerary*, and that is part of the *Gual-Hen*, which ſignifies in Britiſh *antiquum Vallum*, that went between *Pontes*, now *Colebrook*, and the old City *Caleva*, or rather as it was written in the ancienteſt Books, *Gallena* [a]; to which our Fore-fathers adding the word, *Ford*, by reaſon of the ſhallowneſs of the River there, and changing the letter G into *W* (a thing frequently done by the *Saxons* [b]) it was at length called Wallengaford, now more contractedly *Wallengford*.

25. Which 'tis plain ſtood not formerly where it now doth, this old *Vallum*, or high ridged way, pointing down from between *Mungewell* and *Nuneham-Warren* on *Oxford-ſhire* ſide the *River*, as deſcribed in the *Map*, near a mile below the *Town* as it is now ſeated; whereabout, in all likelyhood, on the other ſide the River ſtood that part of the *City* containing the 12 Pariſhes, laid deſolate by a great Plague that reigned there, *temp. Edw.* 3. Which

[y] *Raph. Holinſhed's* deſcription of *Britan, lib.* 1 *cap* 19. [z] Antiquities of *Warwick-ſhire in* Barlichway Hundred, *pag.* 568. [a] See *Burton's* Commentary on *Antoninus* his *Itinerary*. *Itinere* 7. *à Regno Londinium*. [b] See *Rich. Verſtegan's* Antiquities of the Engliſh Nation, *cap.* 5. *ſub finem*.

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great blow it could never recover (though much endeavored by *Rich.* 2.) the Bridges of *Abington* and *Dorcheſter* being alſo about that time built, which diverted the Trade another way, whereas before there was no paſſage over the *Thames* but here at *Wallengford* [c].

26. This *Vallum* or ridged Bank, now called *Grimes-dike*, as it runs towards *Pontes*, yet remains very high, but is but ſingle till it comes to the Woods near *Tuffield*, alias *Nuffield*, where it appears double with a deep *trench* between, like the ways near *Piperno* and at *Porto* in *Italy* [d]; which induces me to believe, that that part next *Wallengford* was once ſo too, and therefore ſtill called *Grimes-ditch*, the *trench* in all likelyhood being filled up with one of the *banks* thrown into it upon the increaſe of *Agriculture*, perhaps at firſt deſigned only to carry off the *water*, and the two *banks* on each ſide for the *carriages* 'twixt the *ſtations* *; thoſe from *Wallengford* to *Pontes* going upon one *Bank*, and thoſe from *Pontes* to *Wallengford* upon the other, ſo that there could be no diſturbance by meeting on the way. From *Tuffield*, I was told, it held on its courſe through the thick Woods, and paſſed the *River* below *Henly* into *Berk-ſhire* again, but the Woods ſcarce admitting a *foot* paſſage, much leſs for a *Horſe*, I could not conveniently trace it any further.

27. There ſeems alſo to have been caſt up another *Roman way*, between the old City of *Alceſter* in the Pariſh of *Wendlebury* (of which more anon in its proper place) and the *City* of *Calleva*, whereof there is part to be ſeen to this day running quite croſs *Otmoor*, as deſcribed in the *Map*, and coming out of the *Moor* under *Beckley* Park-wall; which 'tis plain, has been paved (as indeed it had need) by the ſtones yet found upon, and about the *ridge*, and no where elſe on the *Moor*. From *Beckly* it paſſes on to, and may plainly be ſeen in the *Wood* near *Stockers*, where cutting the *London* road to *Worceſter*, it goes plainly through the *fields* to *Stafford-Grove*, and thence over *Bayards* watering-place, toward *Heddington* Quarry pits, leaving *Shotover-hill* on the *left*, and the *Pits* on the *right* hand.

28. At the foot of *Shotover-hill* it enters *Magdalen College* Coppices, and thence through *Braſen-noſe College* Coppices, over the

[c] *Vid. Lelandi Comment. in Cygneam Cantionem in verbo Caleva.* [d] *Vid. Leon. Bapt. Alberti de re Ædific. lib. 4. cap. 5.* * *Ibidem.*

Eaſtern

Eaſtern part of *Bullington-green*, as I gather by its pointing, for it is not to be ſeen there, it having been ploughed down as well in the *green*, as *fields* thereabout, as may be ſeen by the marks of the *ridge* and *furrow* yet remaining upon it; whence I gueſs it paſſes on towards the two *Baldens*, and ſo for *Wallingford*; going over the River at *Benſon*, alias *Benſington*, where it may be ſeen again running *Weſt* of the *Church*, and is there called by the name of *Medlers-bank*.

29. If it be asked why this way 'twixt *Wallengford* and *Alceſter* was laid ſo crooked? it is plain, 'twas for the convenience of taking *Oxford* in the way as occaſion ſhould ſerve. For though I could not diſcover the *diverticulum* tending toward *Oxford* in the way from *Wallengford*, yet in the way from *Alceſter* it remains at ſome places yet plain and evident, coming out of the main road about the Pariſh of *Beckley*, and paſſing more *Weſtward* through *Stow-wood*, and more particularly through the grounds ſtill called *Principal* (for that they were formerly the *Principal Coppices* before the diſ-forreſting that *Wood*) where the way is to be ſeen entire and perfect, having formerly been *paved*, as appears by a *ditch* cut through the *bank* in a diviſion of theſe grounds, where the ſtones lie *arch-wiſe* in form of the *bank*, there being none neither like them in the *fields* thereabouts.

30. Coming almoſt as far as *Elsfield*, where it is now deeply trenched between two *banks*, like ſome part of *Grimes-dike* mentioned above, it is broken down and diſcontinued, I ſuppoſe by *ploughing*, but points juſt upon *Heddington*, whereof the *hollow lane* aſcending into the *Town*, near Mr. *Pawlings* new Buildings, perhaps may be a part; and the *deep way* between two green banks a little on this ſide *Heddington*, another; and the hollow way on the brow of *Heddington-hill*, another piece of it. Out of which there ſeems alſo another way to have branched about the top of the hill, which paſſing through the grounds 'twixt that and *Marſton-lane*, where it is plain to be ſeen, by its pointing ſhews as if it once paſſed the *River* above *Holy-well Church*, ſtraight upon St. *Giles*'s, or the old *Belloſitum*, now *Beaumont*; where about *Thomas Rudburn* in his *Chronicon Hydenſe*, ſays, anciently before its reſtoration by *Ælfred*, the *Univerſity* was ſeated: *Quæ Univerſitas* Oxoniæ *quondam* (ſays he, having before diſcourſed of its *reſtoration* by *Ælfred*) *erat extra Portam Borealem ejuſdem Urbis, &*

erat

erat principalis Eccleſia totius Cleri, Eccleſia Sancti Ægidii extra eandem portam *. Which two put together, perhaps may make as much for the *Antiquity* of this place, as need be brought for it.

31. Beſide, this *branch* out of the way 'twixt *Alceſter* and *Wallengford* pointing toward *Oxford*, I muſt not forget there is another that ſeems deſignedly made for a paſſage hither immediatly from *Alceſter*, whereof there is a part ſtill remaining about *Noke*, whence it paſſes through the *fields* to the *purlue* grounds, where it cuts the *Worceſter* road, and ſo into *Drunſhil*, formerly a part of the *Forreſt* of *Stow-wood*, where about fourteen years ſince there were ſeveral *Roman Urns* and *Coins* dug up; beyond which place I could not trace it, it being ploughed down in the following grounds, which yet is the beſt conjecture I can make of it, unleſs we ſhall rather ſay it was only laid this way to avoid *Otmoor* in the *winter* ſeaſon, when it is uſually under water; and that it turned about again (as indeed it ſeems to point) and joyned with the forementiond to *Wallengford* and *Oxford*.

32. Nor muſt it be omitted, that the people hereabout call that part of this way that lies through *Otmoor*, by the name of *Akeman-ſtreet*, ſuppoſing it to have come from *Wallengford*, and to have paſſed on by *Alceſter* to *Banbury*; to which name of theirs, and courſe of the way, Mr. *Camden* ſeems to afford his tacit conſent [e]: wherein I wonder they, but more that he, ſhould be ſo much or'e-ſeen, ſince he could not but know, that neither end of ſuch a *way* could tend toward *Bathe*, the old Ace-manneſ-ceaſtep, or *Urbs Ægrotorum hominum*; nor they, that the true Ace-manneſ-ſtpæt, comes near indeed to *Alceſter*, but paſſing through the *County* quite another way, both the *City* and way leading to it, having their names from the *ſick perſons*, or *men* with *aches*, travelling on it thither.

33. The true *Akemanſtreet* then, or as ſome call it *Akehamſtreet*, and others *Akermanſtreet*, coming out of *Buckingham-ſhire*, enters this *County* at a Village called *Black-thorn*, whence it paſſes on without any raiſed bank, cloſe by *Alceſter* as far as *Cheſterton*, as deſcribed by the ſhaded or *pointed* lines in the *Map*: whence it goes to *Kirklington* Towns end, and ſo over the River *Cherwell* near *Tackley*, and thence in a ſtraight line to *Woodſtock-Park*, which it enters near *Wooton-gate*, and paſſes out again at *Mapleton-well*

* *Chronicon Hydenſe MS. inter* κειμήλια *Oxonienſ.* [e] *Vid. Camd. Britan. in Comit. Oxon.*

near

near *Stunsfield* ſtile, whence it holds on again as far as *Stunsfield*; and all this way on a raiſed *bank*, as deſcribed in the *Map* by two parallel lines; where breaking off (but ſtill keeping its name) it goes on over the *Evenlode* to *Wilcot*, and ſo to *Ramſden*; a little beyond which *Village*, at a place called *Witty-green*, it may be ſeen again for a little way; but from thence to *Aſtally*, over *Aſtall-bridge*, and ſo through the fields till it comes to *Brodwel-grove*, it is ſcarce viſible, but there 'tis as plain again as any where elſe, holding a ſtraight courſe into *Glocester-ſhire*, and ſo towards *Bath* the old *Akemanceſter*.

34. And out of this *Akemanſtreet*, as moſt other ſuch ways, there are ſeveral *branches*; *viz.* two near *Kirklington*; one at the *Towns* end, which though preſently diſcontinued, yet points juſt upon the *Port* way running *Eaſt* of *Northbrook*, the two *Heyfords*, *Sommerton*, and *Souldern*, for ſix miles together; and another, that by its pointing ſeems to have come out of *Akemanſtreet*, nearer the place where it paſſes the River *Cherwel*, croſſing the *Port way*, and running at the broadeſt place, ſcarce a mile diſtant from it, as far as *Fritwell*, where on the *North* ſide of the *Town* it inclines toward the *Port way*, as if it joyned with it again ſomwhere about *Souldern*, both of them pointing upon the *Fortifications* called *Rainsborough* (perhaps a corruption of *Romansborough*) near *Charleton* in *Northampton-ſhire*: whence in all probability it went to *Vennonis*, alias *Bennonis*, an old *Roman ſtation*, by the *Saxons* after called *Clayceſter*, in the confines of *Warwick* and *Leiceſter-ſhires*; and ſo on to the *Ratæ* of *Antoninus*, or *Ragæ* of *Ptolomy*, now *Leiceſter* [f].

35. This ſecond *branch* of *Akemanſtreet*, about *Fritwell* they call *Wattle-bank*; but in an old *Terrier* of Sir *Thomas Chamberleyns*, it is called *Aveſdich*, perhaps a corruption of *Offa*'s-*ditch*, the great King of the *Mercians*, whoſe *Kingdom* might at firſt be terminated here, though I find he extended it at length as far as *Benſon*, as thinking it for his *honor* and *profit* both, that the *Weſt-Saxons* ſhould have nothing *North* or *Weſt* of the *Thames* [g]. Or if ancienter than *Offa*, it might perhaps be a *prætentura*, or forefence of the *Romans*, raiſed againſt the *Britans* (or *vice verſa*) who might poſſibly be poſſeſt of the *Port way* before.

36. Yet I rather believe they might be both of them *ancient*

[f] *Vid. Ptolomæi Geograph. Edit. per Pet. Bertium.* [g] *Vid. Camd. Britan. in Com. Oxon.*

ways,

ways, though ſo near together, for we read that the *Romans*, where the *way* was not well laid out, or was *longer* than needed, did commonly (to keep the people from *idleneſs*, and the *Soldiers* from *mutinies*) lay them *ſtraiter* and better; as *Galen* witneſſeth that *Trajan* did in *Italy*: ἔνθα δ' οὐδὲ μήκης ἐ περισπόντως ὁδὸς ἦν, ὀνταῦθα σώτομον ἑτέραν τεμνόμενος[h], *i. e.* that where the way was *longer* than needed, he cut out another *ſhorter*, which poſſibly might alſo be done *here*, the *Port way* being much ſhorter and more direct then *Aveſdich*, to the place whither they both ſeem to hold on their courſe: which may alſo be the reaſon of the two *Ikenild ways* under *Stoken Church* hills, there being about *Lewkner* and *Aſton Rowant*, an *upper* and *lower Ikenild way*.

37. Beſide theſe, there are yet two other *branches* coming out of *Akemanſtreet*; one in *Woodſtock Park* near Col: *Cooks* Lodge, whence it runs toward the *trees* called *Oak* and *Aſh*, not far from *Glympton*, where it is diſcontinued; and where to be met with again I could no where find; ſo that all I can ſay of it is, that towards the end it points *North-weſt* towards *Enſton* and *Chipping-norton*, and ſeems to have cut another ſuch like way near *Upper Kiddington*, which has its *period* there, as far as I could learn, but runs as far as *Ditchley* the other way, where the *ridge* turns to a *ditch* by the name of *Grimes-dike* (as that near *Wallingford*) and gives name I ſuppoſe to *Ditchley* that ſtands upon it, a *Seat* of the Right Honorable *Edward Henry* Earl of *Lichfield*'s, whence it runs in that manner fair and viſible for about half a mile: but before it comes to *Charlbury*, turns again to a *ridge*, very high and lofty at a place called *Baywell*, where it enters into *Cornbury Park* but ſcarce viſible there; yet as I was told, to be found again in the *woods* beyond it, and that it *pointed* toward *Ramſden*, where at firſt (as I gueſs) it branched out of *Akemanſtreet*.

38. But whether *this*, and the other before-mentioned tended, is hard to gueſs, no *Roman ſtation* lying near this place, unleſs I may be allowed to conjecture by their *pointing*, at a great diſtance, which muſt needs be very uncertain. However, becauſe a gueſs perhaps may better pleaſe than to ſay nothing, I conjecture the way by *Ditchley* may tend either toward *Vennonis*, and *Ratæ*, as the *Port way* and *Aveſdich* afore-mention'd were thought to do, or elſe toward *Tripontium*, now *Touceſter* in *Northampton-ſhire*;

[h] Γαλήνε θεραπευτικῆς μιβλ. β. ιε. δ'. κεφ. ή.

and that from *Woodſtock* toward *Manduefſedum*, now *Mancheſter* in *Warwick-ſhire*, or rather the old *Etocetum*, now the *Wall* in *Staffordſhire*.

39. Which are all the *raiſed banks* or deep *trenches* that I met with in *Oxford-ſhire*, except the two *banks* with a *trench* between them (therefore called *dike-hills*) South and by Weſt of *Dorcheſter*, which I cannot imagin part of any *Roman way*, becauſe extended only as a *ſtring* to a great *bow* of the River *Iſis*, as deſcribed in the *Map*; but rather a *Fortification*, ſuch as *P. Oſtorius Proprætor* here in *Britan* under *Claudius*, is ſaid by *Tacitus* to have made on the Rivers *Antona* and *Sabrina* *; or elſe ſome of the Outworks of the Fortifications on *Long-Witenham* hill on the other ſide the water, which perhaps was the *Sinnodunum*[i] of the ancient *Britans*.

40. Nigh to the *raiſed ways* thus caſt up by the *Romans*, they placed the *Tumuli*, or Sepulchres of their *Generals*, or ſuch other valiant perſons as dyed in the *wars*; it being forbid by the Law of the 12 *Tables* to bury within their *Cities* or *Stations*. *Hominem mortuum in Urbe ne ſepelito neve urito*[k]: And by a *penal Reſcript* of the *Emperor Hadrian*[l]. Now the reaſon why they placed them on the *military ways*, rather then elſewhere, is given us by *Camden*, *viz.* that *Paſſengers* might be put in mind, that as theſe here buryed were ſomtimes mortal men, that they themſelves are no better now[m]: whence perhaps the *formula* ſtill uſed on *Tombs*, *Siſte Viator*, and *monumentum à monendo*.

41. But I gueſs that there could not but be ſomwhat more in't, for as it was accounted the greateſt *diſhonor* imaginable to lie *unburyed*, ſo it was a great *reputation* to the *perſon* deceaſed to be cover'd with a large *Tumulus*, which 'tis like might in part at leaſt be the reaſon of their placing them ſo near the *public ways*, that *Paſſengers* might continually add to the *heap*, it being look'd upon as *piety* in them ſo to do; nor ſufficed it to throw on a ſingle handful of earth, but (as may be collected from *Horace*) uſually three. For in *Archytas*'s requeſt to the *Mariner*, that he would not ſuffer his Body any longer to lye on the *ſhoar* unburyed, he makes it part of his *plea*, that notwithſtanding the ſwift motion of Seamen, yet he might find time enough to throw 3 handfuls of duſt.

* *Taciti Annal. lib.* 12. *cap.* 31. [i] *Vid. Leland. Comment. in Cygneam Cant. in verbo Sinnodunum.* [k] *Ex Legibus* 12 *Tab. de Jure Sacrorum. Vid. etiam Cicer. de L. L. lib.* 2. [l] ff. *De Sepulchro violato. L. Prætor ait*, §. *Divus Hadrianus.* [m] *Vid. Camdeni Britan. in Com. Wilts.*

Quan-

Quanquam festinas, non est mora longa; licebit
Injecto ter pulvere curras [n].

42. Which way of *burial* under *Conical hillocks*, whether naturally composing themselves into that *Figure* by the fall of the *Earth*, or designedly so made by the *Soldiers*, was sure very ancient; for from their being placed without *Cities*, I find them called by the *Greeks*, ὑπερπόλιοι λόφοι, and upon *High-ways*, Ερμαῖοι, for that the God *Mercury* had the charge of *ways*; as his other name Ενόδιος likewise imports.

Ηδη ὑπὲρ πόλιος ὅδι Ερμῆος λόφος ἔσται [o].

We find also *Achilles* in *Homer*, complaining how small a *Tumulus* he had made for his beloved *Patroclus*,

Τύμβον δ' ὐ μάλα πολλὸν ἐγὼ ποιέεσθαι ἄνωγα
Αλλ' ὀπαιέα χοῖον, [p] &c.

and intreating *those* should come after to raise it higher, which desire of his was piously performed by the succeeding *Greeks*, who raised it to so great a height, that they designed it for a Sea-mark to those that should sail the *Hellespont*.

μέγδα χ' ἀμῶμονα τύμβον
Χδάμδι Αργείων ἱερὸς κρατὺς ὄς [q].

and this I find here, and at all other places, they always performed χδύαντες δὲ ὅ σῆμα [r]; and so again in the erection of the *Tumulus* over *Hector* [s], by pouring on *earth* or *stones*; the word χέειν, as *Eustathius* informs us, being sometimes used absolutely, *pro* γῆ ὄπχειν τοῖς τεθνεῶσι [t]. *i. e.* (in the most critical sense) for *humare*.

43. It was also very ancient amongst the *Romans*, not only for *Princes*, as *Virgil* witnesses,

fuit ingens monte sub alto
Regis Dercenni *terreno ex aggere bustum.*
Antiqui Laurentis, opacaque Ilice tectum [u].

with whom agrees *Lucan*,

Et regnum cineres exstructo monte quiescunt [w].

[n] *Q. Horatii Flac. Carminum, lib.* 1. *Ode* 28. [o] *Hom. Odyss.* βιβ. π'. v. 471. [p] *Hom. Iliad.* βιβ. ψ'. v. 245. [q] *Hom. Odyss.* βιβ. ω'. v. 80. [r] *Hom. Iliad.* βιβ. ψ'. v. 257. [s] *Ibid.* βιβ. ω'. v. 801. [t] *Vid. Eustathii Schol. in Hom.* [u] *Æneid. lib.* 11. *v.* 850. [w] *An. Lucani Pharsalia sive de bello Civili, lib.* 8. *sub finem.*

but alſo for meaner perſons; for thus we find *Æneas* burying his Nurſe *Cajeta*,

At pius exequiis Æneas rite ſolutis.
Aggere compoſito tumuli, &c [x].

Nay ſo very ancient was it, that *Pliny* ſays expreſly, it was long in uſe amongſt them before *Burning*, *Ipſum cremare apud Romanos non fuit veteris inſtituti*; *terra condebantur*, *i. e.* that they always *interred* them, till they began to underſtand that the bodies of their *men* ſlain in the *wars* afar off, were ſomtimes taken forth from under their *Tumuli*, and barbarouſly abuſed [y], as *Florus* acquaints us the *Germans* ſerved the body of the *Conſul Varus*, amongſt other indignities offer'd the *Romans*: *Ipſius quoque Conſulis Corpus*, *quod militum pietas abdiderat*, *effoſſum* [z].

44. To prevent which *barbarity* for the future, they ordained *burning* before *tumulation*, as was uſed always amongſt the *Greeks*; for we find in *Homer*, that the body of *Hector* (as well as *Patroclus*) was firſt burned, and his calcined white bones then gathered by his *Friends* and put in an *Urn*.

Ὀστέα λευκὰ λέγοντο καιγνῆτοι ἑταῖροί τε [a] &c.

and then follows their raiſing a *tumulus* over him, which it ſeems was of ſtones,

αὐτὰρ ὕπερθε
Πυκνοῖσιν λαέσσι καλὸν ὄρεσσθαι μεγάλοισι [b].

and yet expreſſed as where made of *Earth*, by pouring them on, Χεύαντες ὃ τὸ σῆμα [c].

45. It was a uſual cuſtom alſo amongſt the *Northern* Nations, in their ſecond *Age*, which they called Hoigold, or Hoelſt tijd, *Tumulorum Ætas*; thus to bury their dead under earthen hillocks, *Arenam & terram exaggerando uſque dum in juſtam monticuli exſurgerent altitudinem*, ſays *Wormius* of the *Danes* [d]; and of theſe he ſays they had two ſorts, the *Rudiores*, which, *ex ſola terrâ in rotunditatem & Conum congeſta conſtabant*, *i. e.* that were made only of *Earth*, caſt up in a round *conical* figure, which were ſet up in memory of any ſtout *Champions* that had deſerved well of their

[x] *Æneid. lib. 7. v. 5.* [y] *Plin. Secund. Nat. Hiſt. lib. 7. cap. 54.* [z] *L. An. Flori Rerum Rom. lib. 4. c. 12.* [a] *Hom. Iliad. βιβ. ω. v. 793.* [b] *Ibidem v. 797, 798.* [c] *Ibidem, v. 801.* [d] *Olai Wormii, Monument. Danic. lib. 1. cap. 7.*

Country.

Country. And the *Ornati*, which were encompaſſed with a *circle* of *ſtones*, ſet up only for their *Generals*, or ſome other great *Perſons* [e].

46. And theſe they ſet over the Bodies without *burning* them (as they had formerly done in their *firſt age*, which they called **Rotfold**, or **Brende tijd**, *Ætas ignea* [f]) the manner being as Mr. *Camden* informs us, for every *Soldier* remaining alive after a *field* fought, to carry his *head-piece* full of *earth*, towards making the *tombs* of their *fellows* that were ſlain [g], Χεύαντες ὃ τὸ σῆμα, *fundentes tumulum*, after the manner of the *Greeks*.

47. But the *Romans* here in *Britan*, having little reaſon to expect more favor then they found in *Germany*; whenever any *Conſul*, or eminent *Warrior* dyed in ſuch an *Expedition*, firſt *burned* them on the level near the *via ſtrata*, or *militaris*; by which means having deprived their exaſperated *Enemies* of all hope of being able to abuſe the dead *bodies*; they more-over endeavored to prevent the very ſcattering their *aſhes* in haſt, the whole *Army* caſting on them pure *graſſy turfs*, cut from the ſurface of the ground, which probably indeed may be the very reaſon (as the learned and ingenious Mr. *Dugdale* [h] gueſſes) why there appears not any hollowneſs whence the *earth* was taken that raiſed theſe *Tumuli*.

48. Whereof here in *Oxford-ſhire* I have met with two kinds; one placed, as above, on the *Prætorian ways*; and the other ſort not ſo, yet both commonly called *Burrows*, alias *Barrows*, from the *Saxon* Beorg, *collis*, *acervus*, whence our word to bury [i]. Hence alſo the *raiſed banks*, made for *Conies* to hide themſelves, ſays Sir *Henry Spelman*, were alſo called *Berries* [k]. Of the firſt ſort is the *hillock* in the Pariſh of *Fritwell*, called *Ploughly-hill*, ſtanding juſt within *Oxford-ſhire* on the *Port way*, and (which is ſomwhat more then ordinary) giving name to the *Hundred* wherein it ſtands.

49. And there is another on the Weſt ſide of that branch of *Akemanſtreet* that comes out of *Woodſtock* Park, cloſe by the *Rivulet* over which that way paſſes; but the moſt eminent on *Akemanſtreet*, is that they call *Aſtall Barrow*, ſtanding high and lofty, which I conceive might be the *Sepulcher* of ſome conſiderable *per-*

[e] *Ibidem lib.* 1. *cap.* 6. [f] *Ibidem cap.* 7. [g] *Vid. Camd. Britan. in Com. Wilt.* [h] Mr. *Dugdale's* Antiquities of *Warwick-ſhire*, in *Knightlow* Hundred. [i] *Vid. Guſtel. Somneri, Dictionar. Saxonico Latino Angl. in verbo.* [k] *Vid. Spelmanni Gloſſarium in verbo Bergium.*

ſon,

ſon, at leaſt of great repute amongſt the *common people* that paſt that way; there being another, not far off upon the ſame way, on the edge of *Oxford-ſhire*, incomparably leſs.

50. Upon theſe their *High-ways* it was alſo uſual amongſt them to place *pillars* of *ſtone*, whereon they inſcribed the diſtances from the *regal Cities*, *Stations*, and *Mutations*, whence the phraſe, *ad tertium, quartum, vel quintum, ab Urbe lapidem*, *i. e.* ſo many *miles* from the *City*. And of theſe I think the *ſtone*, that yet lies on a bank cloſe by *Akemanſtreet* way, not far from *Aſtall Barrow*, to have been a remnant, and moſt likely of any the *pedeſtal* of ſuch a *Pillar*: unleſs we ſhall rather think it to have been a *pedeſtal* to a *Statue* of *Mercury*, made with *four ſides* and without *arms*, from thence called τετράγωνος, ἄωλος, or *Cyllenius* [l], and in old time *Hermæ*, which were alſo uſed every where to be ſet up near *high-ways*; and if in croſs *roads*, with as many *heads* as there were *ways*, *ut interdum etiam quatriceps conſpiceretur* [m].

51. Whatever it were, no doubt this, and the fore-mention'd *Barrows*, were of *Roman* erection; but as for *Kenners Barrow* near *Shipton* under *Which-wood*, the large *Barrow* at *Stanton-Harcourt*, and that other (if it be one) called *Adwel Cop*; I think rather erected by the *Britans* or *Danes*, for that near no *high-ways*, but in the open fields, as *Saxo-Grammaticus* [n], and *Wormius* ſay they made them: *Non ſolum in campis & pratis occurrunt Tumuli, ſed & in Silvis & Lucis, &c.* [o] *i. e.* that they have them not only in the *fields* and *meddows*, but in the *woods* and *groves* too.

52. More particularly, as for *Kenners barrow* and *Adwel cop*, I think them erected but for inferior *Captains*, though perhaps eminent *Soldiers*, becauſe they are of the *rudiores*, *ex ſola terra*: But for that at *Stanton Harcourt*, if a *Daniſh* Monument, it was certainly a memorial of ſome greater *Perſon*, becauſe of the *ſtones* ſet near it, of which more anon in another place: though it be poſſible too that theſe may be *Roman*, it being cuſtomary for them to ſet up ſuch *Trophees*, at the utmoſt bounds of their *Victories*, or where they could not conveniently advance them further, as *Dion* teſtifies, the Roman General *Druſus* did at the River *Albis*, πρόπαια ϛήσας ἀνεχώρησε [p], *i. e.* that he ſet *Trophies* and returned: which *Trophies* of his, *Florus* ſays expreſly, were only a *Tumulus*: *Nam Mar-*

[l] *Lævini Torrentii Comment. in Horat. Flac. lib. 1. Ode 10.* [m] *Ibidem.* [n] *Saxonis Grammatici Hiſt. Danica, lib. 8.* [o] *Olai Wormii Monument. Danic. lib. 1. cap. 6.* [p] *Dionis Caſſii Rom. Hiſt. lib. 55. ſub initium.*

coman-

comannorum ſpoliis inſignibus quendam editum tumulum in Trophæi modum excoluit, are his very words [q] concerning the ſame *Expedition* of *Druſus*.

53. However it were, 'tis certain the *two* former of *theſe*, are much different from thoſe erected on the *viæ militares*, for I found them *trenched* round, and particularly that of *Adwel cop*, with two or three *circumvallations*, part whereof are ſtill viſible on the South-eaſt ſide of it, inſomuch that I queſtion whether there were not ſome *Camp*, with this *Trophie* perhaps of *Victory* erected within it, of which more anon when I come to ſpeak profeſſedly, of the ancient *Fortifications* yet remaining in this County.

54. Of other *Roman Antiquities* that I can certainly call ſuch, the moſt eminent I met with is a part of their *pavement* made of ſmall *bricks* or *tiles*, not much bigger than *dice*; whereof the *Roman Generals*, amongſt their other *baggage*, were uſed to carry a quantity ſufficient to pave the place, where they ſet the *Prætorium* or *Generals* Tent, or at leaſt ſome part of it, which is particularly witneſſed of *Julius Cæſar*, *In expeditionibus teſſella, & ſectilia pavimenta, circumtuliſſe* [r].

55. Theſe if made of ſmall ſquare *Marbles*, of divers *natural* colours, were called *Lithoſtrota*; but if of ſmall *bricks* or *tiles*, *artificially* tinged with colours, *annealed* and *poliſh'd*, *Pavimenta teſſellata*, or *opus Muſivum* [s]; and both *Aſarota* [t], for their not being to be ſwept, but wiped with a *ſpunge*. As for ours ploughed up ſomwhere about *great Tew*, and engraven *Tab.* 15. *Fig.* 22. I take it for certain to be of the ſecond ſort, it conſiſting of a matter much ſofter than *Marble*, cut into *ſquares* ſomwhat bigger then *dice*, of four different colours, *viz. blue*, *white*, *yellow*, and *red*, all *poliſhed*, and orderly diſpoſed into *works*; the colours of the *ſquares* being repreſented in the *Cut*, as thoſe of the *Arms* in the *Map*.

56. There was much ſuch another *Pavement* ploughed up at *Steeple-Aſton*, conſiſting likewiſe of *ſquares* of divers colours, and ſet in curious *figures*, but as deſcribed to me by the Reverend Mr. *Greenwood*, Rector of the place, not *cubick* like the former, but *oblong ſquares* ſet perpendicular to the *Horizon*. That theſe *Pavements* were *Roman*, I think there's no doubt, notwithſtand-

[q] *L. An. Flori Rer. Roman. lib.* 4. *cap.* 12. [r] *Suetonius in vita Julii Cæſaris.* [s] *Salmaſii Annot. in Sueton. in vita Julii Cæſaris.* [t] *Plin. Sec. Hiſt. Nat. lib.* 36. *c.* 25.

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ing found near no *Roman ſtation*, and far enough removed from any *Roman high-way*; (except the *branches* of *Akemanſtreet* from from *Ramſden* and *Woodſtock*, might happily paſs theſe places:) but I gueſs not ſet here till they wholly poſſeſt themſelves of this *Southern* part of *Britan*, and might ſecurely enough paſs their *Armies* any where; and therefore cannot afford them any higher *antiquity* than the time of *Agricola* the Lieutenant of *Veſpaſian*, who compleated the *Roman* Conqueſts; or at moſt of *Paulinus*, that defeated *Boadicea*.

57. Under the *Sepulchral monuments*, or *tumuli* afore-mentioned, raiſed by the *Romans* over their *dead* in memory of them, they placed the more immediate receptacles of their *aſhes*, or at leaſt ſome part of them, as much as could be ſaved in the *Vas uſtrinum*; for they were not ſo curious as ſome have imagined, to ſcrape together all the *bones* and *aſhes* of the *Corps*, as may be eaſily collected from the ſmalneſs of all *Urns*, but *Family ones*. Yet over all their *Urns* they raiſed not ſuch a *tumulus*; for we find them many times in *level* ground, though containing the remains of *noble Perſons*, as may be gueſſed by the *Lamps*, *Lachrymatories*, and *Veſſels* of *Oyls*, or *Aromatical Liquors* ſomtimes found with them.

58. Of which ſort of *Veſſels*, I preſume that odd faſhioned *glaſs*, depicted *Tab.* 15. *Fig.* 23. muſt needs be one, found in a place called *buſhy Leas*, betwixt *Brightwel* and *Chalgrave*, being part of the poſſeſſions of that right worthy Gentleman, *John Stone* of *Brightwel* Eſq; ſurrounded with no leſs than twelve of thoſe *Urns*, *Tab.* 15. *Fig.* 24. both which, amongſt many other ſignal favors, were kindly beſtowed on me by the ſame worthy *perſon*. That the *Earthen pot*, *Fig.* 24. is a *Roman* Urn, I take to be ſo plain, that it would not need proof, though one of the four *Regal high-ways* were much farther removed than *Ikenild way* is, which comes up almoſt to *Ewelm*, not far from this place: But whether this *glaſs* contained a *lamp*, were a *Lachrymatorie*, or a *veſſel* containing *water*, or ſome *Aromatical liquor*, is the great queſtion next to be determined.

59. That the Bodies of great Perſons were uſually accompanied with *Lamps* after death, is plain from the *Civil Law* [u], and to interr *Lamps* with them, was heretofore ſo frequent, that *Fortunius Licetus* has written a whole Book, *De reconditis Antiquorum*

[u] ff *De Manumiſſis Teſtamento, L. Mævia.*

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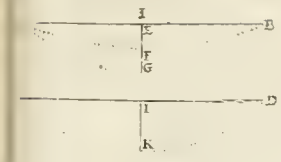
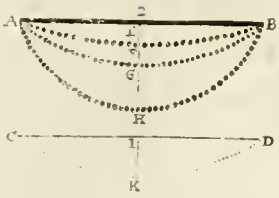
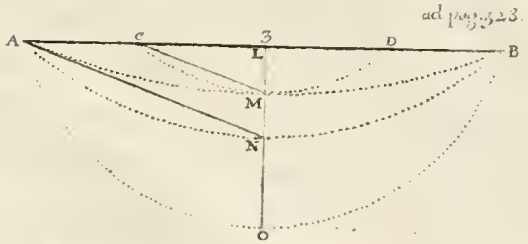
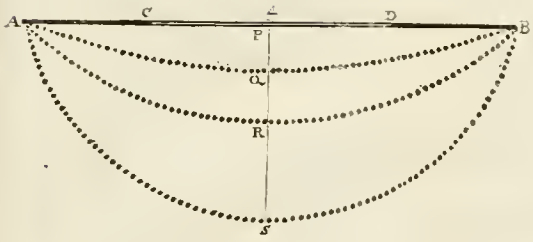
TAB XV.

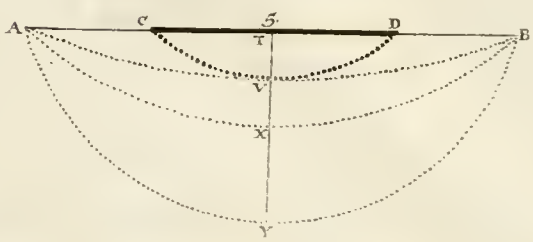
ad pag. 323.

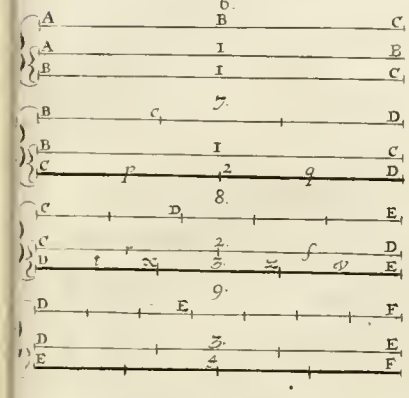


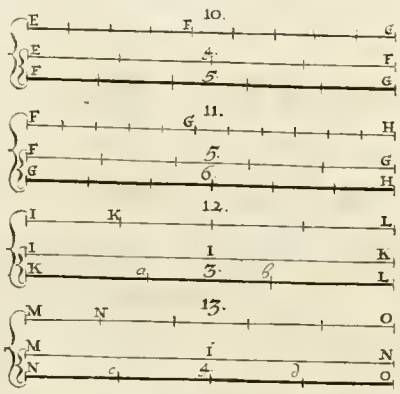


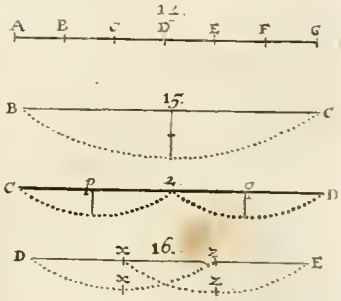


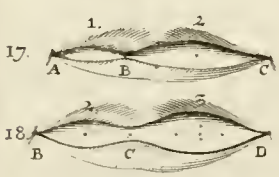


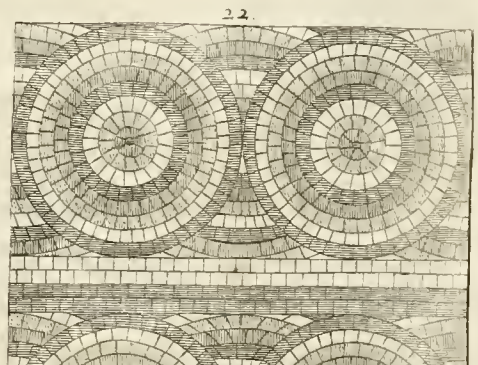


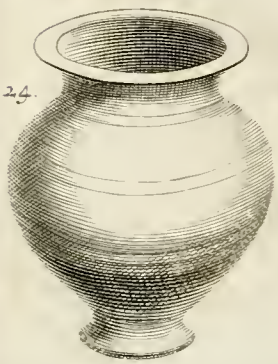












To the Worsp.ll
The worthy and much Honored
Gentlemen IOHN and CARLETON STONE Esqrs
This 15th Table
consisting partly of Antiquities whereof the 23.d and
24th were found in the grounds near their Seat at
Brightwel, in memory of their favours is gratefully
dedicated by
R. S. D.

Lucernis, amongſt which he mentions one out of *Baptiſta Porta*, called *Lucerna Neſidea* (from the Iſland where found *in Crateré Neopolitano ſita*) which was included within a *glaſs*, and placed in a Marble *Tomb*[w], upon the ſame account (I ſuppoſe) that indeed all others were; both as a Symbol of the quality of the *perſon* there interr'd, and for the ſake of the *ſoul*, which they thought did not ſo quite deſert the *body*, but that it reſted with it in the grave[x].

60. But that ours was ſuch a *glaſs* including a *lamp*, I dare not conclude, more than that it is barely poſſible it might be ſo, it ſeeming much rather likely to have been a *phiala Lachrymatoria*, or *tear-bottle*, wherein the ſurviving Friends of the deceaſed, collected thoſe paſſionate expreſſions of their grief, and uſually buryed with them, as is ſomtimes ſignified in old *Inſcriptions*, by ſome ſuch expreſſion as, *Cum lachrymis poſuere*[y]; only it is of a much different figure from any of thoſe deſcribed in *Joh. Bapt. Caſalius*[z], and *Paulus Aringhus*[a].

61. And therefore I rather believe it to have been one of thoſe *veſſels* containing ſome *Aromatical liquor*, ſuch as they uſually *interred* with the *Urns* of *Noble Families*[b], and perhaps a *glaſs* of the ſame kind with thoſe three found in a *Roman Urn*, preſerved by Cardinal *Farneſe*, and mentioned by *Vigeneri*[c]: Except we ſhall rather think it the *veſſel* for the *Aqua luſtralis* ſprinkled by the *Prieſt* on the *Urns*, to expiate for the ſmaller faults of the deceaſed[d], which poſſibly they might after *bury* with them, which *waters* were otherwiſe called *arferiæ aquæ*, and by the *Greeks*, χόνια λυτρά, or ὕδωρ ὅτι τοῖς νεκροῖς σπενδόμενον[e]: But I rather incline to the former of the *two*, becauſe there ſeems a kind of *white ſubſtance* yet remaining between the two *coats* of the *glaſs* (it being a *veſſel* of a peculiar make, one *glaſs* as it were including *another*) which poſſibly might be the *ſediment* of ſome ſuch *Aromatical liquor* when dryed away.

62. Alſo in the Pariſh of *Wendlebury* I ſaw a great *ſquare ſtone*, hollowed round in the middle, dug up in or near the old *City* of *Aldceſter*, in which there was ſet a *glaſs bottle* fitted to it, containing nothing but ſomwhat like *aſhes*, and cover'd over above

[w] *Bapt. Portæ Magiæ Nat. Lib.* 12. *cap. ult.* [x] *Fortunii Liceti de reconditis Antiquorum Lucernis, Lib.* 3. *cap.* 6, & 7. [y] *Vid. Johan. Bapt. Caſſalium de Urbe, & Ritibus Romanorum, cap.* 21. [z] *Ibidem.* [a] *Pauli Aringhi Roma ſubterranea, lib.* 3. *cap.* 22. [b] Sir Thomas Brown's *Hydriotaphia, cap.* 3. [c] *Ibidem cap.* 2. [d] *Joh. Bapt. Caſalius de Urbe & ritibus Romanorum, cap.* 22. [e] *Vid. Joh. Meurſium de funere, cap.* 14.

with another broad flat *ſtone*: This *Urn* I ſaw at a houſe in the *Town*, where 'tis uſed for a *Hog-trough*, but the *glaſs* had been broken long before, nor could I get any certain deſcription of it; however, I gueſs it ſome ſuch like *veſſel* with that deſcribed above, and placed there upon the ſame or like accounts. There have been ſeveral other *Urns* alſo taken up at divers other places, particularly in the old *Mine* at *Blunds Court* above-mention'd, *Chap.* 6. §. 63. at a place called *Drunſhil* not far from *Wood-Eaton*, but belonging, as I was told, to the Pariſh of *Marſton*, near the ridged way that comes from *Noke*; and three in one Mr. *Finches* houſe at the *Mercat*-place in *Henly*, and one in the high-way that leads towards the *North* at the *Towns* end, not far from *Ancaſtle*, which argues thoſe places ſome of the firſt *Roman habitations*, though no *recorded gariſons*.

63. Nor indeed is there any ſuch to be found in this County, though it cannot but be acknowledged that *Oxford* it ſelf muſt be a noted place, before the departure of the *Romans* at leaſt, if the *Roman* way thither deſcribed in the *Map*, prove ſo good an argument to the *Reader* as my ſelf. Where by the way perhaps it may not be unworthy notice, that *Oxford* is mention'd by the *Arabian* Geographer, *Sharif ol' Edrîſi*, or *Adrîſi* (of whoſe *works* the *Geographia Nubienſis* tranſlated by *Gab. Sionita*, and *Joh. Hezronita*, is too ſhort an *Epitome*) by the name of عزكفرت *Ozcfort* *, withal adding, that it ſtands on the ſame *river* with *London* (which *river* he calls رطاندة *Retandah* †) 40 miles above it [f], which ſhews that *Oxford* was always a *Town* of good repute, in the remoteſt *places*, as well as *times*.

64. As for the *antiquity* of the *Univerſity*, beſide what was alleged §. 30. of this *Chapter*, I think it very conſiderable what remains upon *record* in *Magdalen College Library*, in an ancient MS of *Walter Burley*'s Fellow of *Merton College*, (*Tutor* to the Famous King *Edw.* 3. and deſervedly ſtiled Dr. *Profundus*) upon the *Problem* [*Complexio rara quare ſanior*] he has theſe words (which ſhonld indeed have been mentioned before, *Chap.* 2. §. 3.

* Perhaps written عزكفرت *Ozcfort*, (by a tranſpoſition of the Letters which many times occurs in words of difficult ſound) inſtead of عكزفرت *Oczfort*. † رطاندة *Retânde* ſeems to be a fault of the Scribe: whereas the Author probably intended to have it read طامرة *Tâmize*, or *Tâmiſe*. [f] *Sharif Ol' Edrîſi Geograph. MS. Arab. penes Reverend. Edw. Pocock, S. T. P. & Eccleſ. Cath. Chriſt. Oxon. Canonicum.*

of

of this *Eſſay*) concerning the *healthy ſituation* of *Oxford*, and its ſelection by *Students*, for the ſeat of the *Muſes*: *Notanda*, inquit, *ſunt tria*, *quod* Civitas *ſana eſt in* Borea *& in* Oriente *ſi plantata eſt aperta*, *& in* Auſtro *&* Occidente *ſi montoſa*; *propter puritatem* Boreæ, *&* Orientis, *& putrefactionem* Auſtri *&* Occidentis: *ſicut* Oxonia, *quæ per induſtriam Philoſophorum de* Græcia *fuerat ordinata* [g], *i. e.* that a healthy *City* muſt be open to the *North* and *Eaſt*, and mountanous to the *South* and *Weſt*; by reaſon of the purity of the two former *quarters*, in reſpect of the latter: juſt as *Oxford* is ſeated, which was ſelected by the *Philoſophers* that came from *Greece*.

65. And that according to the rules of their great Maſter *Hippocrates*, who requires no other, but the very ſame ſituation for a healthy *City* [h]. But about what time it was theſe *Philoſophers* arrived, though I dare not be too confident, yet in all probability they might be ſome of thoſe *Græcians* brought over by *Theodorus* the *Greek* Arch-biſhop of *Canterbury*, about the year 668 [i], whom 'tis like he placed here to inſtruct the *Saxon* youth; for we find Venerable *Bede*, and St. *John de Beverlaco* (alwaies reputed of this *Univerſity*) to have been his *Scholars*; and ſo *Tobias* Biſhop of *Rocheſter*, and *Albinus* Abbot of St. *Auguſtins Cant.* who are ſaid to have underſtood the *Greek* Tongue as well as their native one [k].

66. Not to mention that *Britan* was known to the *Greeks* before the arrival of the *Romans*; for otherwiſe *Polybius* could never have hoped to have deſcribed *Britan*, or the *method* there uſed in ordering *Tin*, as we find he deſigned, having promiſed to write, περὶ τ῀ Βρεττανικῶν νήσων, καὶ τῆς τοῦ κατ' ἐκείνους καταστάσεως [l]. Which Book though loſt, yet *Strabo* * bears us witneſs, that therein he refuted the Errors of *Dicæarchus*, *Pythias* and *Eratoſthenes*, concerning the magnitude of *Britan*, who were alſo Greek Authors (that it ſeems had written ſomthing concerning this *Iſland*) and much ancienter than himſelf. Nor to note ſecondly, that the *French Druids* (who had their Learning out of *Britan*) in things of common concern, uſed the Greek *Character* [m]; which how

[g] *In problematibus Ariſtot ſecundum laborem Magiſtri* Walter Burley, *ad ordinem Alphabeti. MS. 65. in Bib. Coll. B. M. Magdal. Oxon fol. 12 b.* [h] Μεταξὺ τῶν δυσμικῶν τῶν θερινῶν τοῦ ἡλίου, καὶ τῶν ἀνατολικῶν τῶν θερινῶν. *Hippocrat. Oper. ſect. 3. cap.* περὶ ἀέρων ὑδάτων, τόπων. [i] *Godwinus de Præſulib. Ang. in vita Theodori.* [k] *Matth. Parker de Antiquitate Eccleſ. Britan. in vita Theod.* [l] *Polybii Megal. Hiſtoriar. lib. 3. p. 209 Edit. Iſ. Caſaub. An.* 1619. * *Strabon. Geograph. lib. 2. pag.* 104. *Edit. Caſaub. Paris, An.* 1620. [m] *Jul. Cæſaris Comment. de bello Gallic. lib. 6.*

they ſhould come by without the learning of the Greeks (which poſſibly might be brought over by ſome of their *Philoſophers* who accompanyed the *Merchants* trading for *Tin*, and ſeated themſelves here) let the *Reader* judge.

67. But for the *Biſhoprick* of *Oxon*, it is but of late erection, taken out of that of *Lincoln* by King *Hen.* 8. and of no longer ſtanding than his days, notwithſtanding what we meet with in the *Decretals* of Pope *Gregory*; where we find two *Reſcripts* of Pope *Alexander* the Third, about the year 1158. directed to the Biſhop of *Oxon.* and *others* [n], it being but a miſtake (though to be found in all the *Copies*, I could meet with) of *Oxonienſi*, for *Exonienſi*, as plainly appears in the fourth *Book* of the ſame *Decretals* [o], compared with the places afore-cited.

68. Yet the ancienteſt *Town* of the whole *County* I take to be *Henley*, ſo called from the *Britiſh Hen*, which ſignifies *old*, and *Lley* a *place*, and perhaps might be the head *Town* of the people called *Ancalites*, that revolted to *Cæſar* [p]: it was alſo called *Hanleganz* and *Hanneburg*, as appears by an *Inſpeximus* of Q. *Elizabeth*, granted this *Corporation*. And there is a place near it, ſtill called *Ancaſtle* (weſt of the Town where the *Wind-mill* now ſtands) which is but the *Norman* name, importing the ſame with the *Saxon Hanneburg*. If it be objected, that *Aldbury* near *Ricot* in this *County* (according to vulgar tradition) is the *mother* of *Henly*, and conſequentially *older*; it may be anſwer'd, that its probable indeed that *Chriſtian Henley* may be younger than *Aldbury*, in reſpect of a *Church* firſt built there, but upon no other account.

69. And the Town of *Watlington* ſeems of no ſmall *antiquity*, provided its *age* do but anſwer its *Etymologie*; for by its name it ſeems alſo to have been an old *Britiſh City*, which according to *Strabo*, were nothing elſe but *groves* fenced about with *trees* cut down, and laid croſs one another, within which they built them *ſheds* both for themſelves and Cattle. Πόλεις δ' αὐτῶν εἰσὶν οἱ δρυμοί, ἀμφιφράξαντες δὲ δένδρεσι καταβεβλημένοις κυκλοτερῆ κύκλον, καὶ αὐτοὶ ἐνταῦθα καλυβοποιοῦνται, καὶ τὰ βοσκήματα κατασταθμεύουσι [q], are his very words: which manner of *fence* the *Saxons* after called patelas *Crates*, hurdles or wattles, within which mound building them *tents* or *co-*

[n] *Decret. de filiis Presbyteror. ordin. & non. c. Propoſuit. & de officio, & poteſt. juſt. deleg. c. Cauſam.* [o] *Decret. qui filii ſint legitimi, c. Cauſam.* [p] *Julii Cæſaris Commentar. de bello Gallico, lib.* 5. [q] *Strabonis Geographiæ, lib.* 4.

verings,

verings, by the *Saxons* alſo called ꝑæcel [r]; from one of theſe, or both, I gueſs this Town took its name.

70. As alſo the *Prætorian* or *Conſular way*, called *Watlingſtreet*, and *Wattle-bank* here in *Oxfordſhire*, theſe in all probability being made the ſame way, that *Hadrian* is ſaid to have made *boundadaries* (where *Rivers* were wanting) between *barbarous* people, *Stipitibus magnis in modum muralis ſepis funditus jactis atque connexis* [s], *i. e.* with great *ſtakes* ſet faſt in the ground, and knit together 'tis like with ſmaller wood *woven* between; which if happily made uſe of in theſe *ways* to keep up the *earth* at firſt, might well invite the *Saxons* to name them *Wattleing-ſtreet*, *Wattle-bank*, *&c.*

71. Juſt upon the meeting of *Akemanſtreet* way, and the *Port way* from *Wallengford*, there are alſo ſome foot-ſteps of that decayed ancient *ſtation*, by *Camden* called *Alcheſter*, ſtill remaining, which he gueſſes ſo called, as one would ſay an *old Town* [t]. But I have met with ſome *notes* in a MS. now by me, that ſays it was the Seat of *Alectus* the *Emperor*, who having trecherouſly ſlain his Friend and Maſter, the Emperor *Carauſius*, baſely uſurped *Britan* for himſelf, calling this his new Seat after his own name, *Alecti Caſtrum*, ſince *Alcheſter* or *Aldceſter*: but it ſeems by the ſtory that it floriſh'd not long, for *Conſtantius Chlorus* being ſent againſt him by the Emperors *Dioclefian* and *Maximian*, and by the benefit of a miſt, landing privatly ſomwhere on the South ſhoar, near the *Iſle of Wight* (whether *Alectus* came to prevent it) gave him battle, defeated, and put him to flight towards this his chief *Fortreſs*, but was over-taken and ſlain by *Aſclepiodotus*, one of *Conſtantius*'s Captains (as this Author will have it) here at *Elsfield* [u] near *Oxon*, (which he alſo would have a corruption of *Alectus-field*) before he could reach it.

72. For the credit of this *relation*, it having no foundation in the *Roman* ſtory, I ſhall wholly leave it to the *Readers* judgment; yet ſhall add thus much for its reputation, that the *Roman military ways* lye very agreeable to it; for on ſuppoſition, this *conflict* happened about *Regnum*, now *Ring-wood*; or *Clauſentum*, now *Southampton*, the *Roman ways* lye directly thence to *Venta Belgarum*, now *Wincheſter*; and ſo to *Callena*, now *Wallengford*,

[r] *Gul. Somneri Dictionarium Saxonico-Lat-Angl. in verbis.* [s] *Ælius Spartianus in Hadriano.* [t] *Camd. Britan. in Oxon.* [u] *MS. penes Authorem.*

accord-

according to the *Itinerary* of *Antoninus*[w]; and thence cloſe by *Elsfield* to *Alcheſter*, as deſcribed in the *Map*, and in §§. 27. and 28. of this *Chapter*.

73. Which is all I find remaining of the *Romans* here, but ſome parcels of their *Mony* found at many other *places*, particularly near *Dorcheſter* not far from *Dike-hills*, near the Fortification at *Idbury*, and *Madmarſton-hill* in the Pariſh of *Swalcliff*, incloſed with a double *vallum*; which I therefore judge to have been *Roman works*. There is alſo a ſmall *circumvallation* in a Wood South and by Weſt of *Harpſden* Church, near which place there has alſo been *Roman* mony dug up (whereof there is ſome in the poſſeſſion of the Worſhipful ..... *Hall* Eſq;) and ſo likewiſe about *Horley*, *Swerford*, *Chippingnorton*, *Teynton*, and a Village called *Sinet* near *Burford*, *Stratton-Audley*, *Fringford* and *Tuſmore*, and moſt of them, of the *Emperors* between *Cocceius Nerva*, and *Theodoſius* the ſecond, excluſively.

74. After the departure of the *Romans* came the *Saxons* into *Britan*, and after them the *Danes*, who alſo made them *Works* ſo indiſtinguiſhable from the *Romans* (otherwiſe than by the *Roman mony* found near them, as in the former *Paragraph*) that they can ſcarce be known aſunder: So that whatever of theſe *Fortifications* (at moſt places in this *County* abuſively called *Barrows*) have no *Roman mony* found at or near them, I think we muſt conclude either *Saxon* or *Daniſh*; *Saxon* if ſquare, and if round *Daniſh*; for ſo I find them diſtinguiſh'd in a MS. Hiſtory of *Ireland* by *E. S.* whereof the firſt ſort he calls *Falkmotes*, *i. e.* places for the meeting of the *folk* or people, upon the approach of the *enemy*; and the latter *Danerathes*, *i. e. hills* of the *Danes* made for the ſame purpoſe[x], though I very much queſtion whether I ſhall find theſe forms ſtrictly obſerved in all places hereafter.

75. Yet I find *Tadmerton-Caſtle*, and *Hooknorton Barrow* not far from it, agreeable to this *rule*; the former being *large* and *round*, and the other ſmaller and rather a *quinquangle* than a *ſquare*; both of them caſt up (the great round one by the *Danes*, and the leſs ſquare one by the *Saxons*) about the year 914, when the *Danes* in the time of *Edward Senior* being grown ſtrong and numerous, came forth of *Northampton* and *Leiceſter*, and made great ſlaughter of the *Engliſh-Saxons* at Hochmeretune, ſays *Joh. Brom-*

[w] See *Burton's* Map of *Antoninus* his Itinerary. [x] Hiſtory of *Ireland*, *MS. penes Authorem.*

ton,

ton, *An.* 10. of *Edw. Sen*[y]. at **Hohenertune**, ſays *Florentius Wigornienſis*, which he calls *Villam Regiam*[z], now *Hoke-norton*.

76. As for *Chaſtleton barrow*, by the above-mention'd *rule*, it ſhould be a Fortification of the *Danes*, perhaps caſt up about the year 1016. at what time *Edmund Ironſide* met *Canutus* the *Daniſh* King hereabout, and defeated him after a long and bloody Battle, fought at a place called *Seorſtan* by *Joh. Bromton*[a], *Sterneſton* and *Sceruſdan* by *Matth. Weſtminſter*[b], *Scearſtan* by *Florentius Wigornienſis*[c] and *Simon* of *Durham*[d], and *Sejerſtan* by *Wormius*, from *ſejer victoria*, and *ſtan lapis*; whereof all the reſt ſeem but corruptions, there being ſeveral ſuch in *Denmark* and *Norway* called by that name to this day *: which though they all ſay expreſly was in *Hwinčtia* or *Huiccia*, *i. e. Worceſter-ſhire*, yet I verily believe it with *Camden*, to be that *ſtone* not far off, called *Four ſhire ſtone* (or elſe that other near it) parting four *Counties*, whereof *Worceſter-ſhire* is one.

77. And as for the *Entrenchments* in *Merton* Woods, I gueſs them caſt up by King *Æthelred*, or the *Danes* in the year 871. at what time ſays *Floren. Wigornienſis*, King *Æthelred* and his Brother *Ælfred*, *cum paganis pugnantes apud* **Meretune**[e], fighting with the *Danes* at *Mereton* (as I find this *town* was anciently written in the *Leigier* Book of *Enſham*[f]) overcame them, and put their whole *Army* to flight. That the *Danes* had ſomwhat to do hereabout, is further evinced, from one of their *ſpurs* in the hands (if I miſremember not) of *George Sherman*, of the Town of *Biſſeter* not far from this place, which I took no care to get *engraven*, becauſe already done by *Olaus Wormius*[g], where the *Reader* may ſee the exact *figure* of it: All which put together, and that this place is near the meeting of two *military ways*, I am pretty well ſatisfied that this Battle between *Æthelred*, his Brother *Ælfred*, and the *Danes*, was much rather here, than at *Merdon* in *Wilt-ſhire*, as ſome have thought it.

78. And if *Adwell Cop* may paſs for a *Fortification*, as the *Entrenchments* about it on the South-eaſt-ſide ſeem to promiſe, I gueſs it made about the year 1010. when the *Danes*, as *Simeon* of *Durham* teſtifies, came forth of their Ships in the month of *January*,

[y] *In Chronico Johan. Bromton. Abbot. Jornalens, in An.* 10. *Ed. Sen.* [z] *Florentius Wigornienſis in Anno* 914. [a] *Chronicon Jo. Bromton Abb. Jorn. in vita Edmundi Fer. lat.* [b] *Matth. Weſtmon. Flores Hiſtor. in An.* 1016. [c] *Flor. Wigor. in An. citato.* [d] *Simeon Dunelmenſis Hiſt. de geſtis Reg. Ang. in eodem.* * *Ol. Worm. Mon. Dan. lib.* 5. *Monumentorum inter Ripenſia* 5. *p.* 343. [e] *Floren. Wigornenſis in An citato.* [f] *E Regiſtro de Enſham, MS. penes Reverendiſſimum Decanum & Capitulum Eccleſiæ Cathedral. Chriſt. Oxoniæ.* [g] *Olai Wormii Monument. Danicor. lib.* 1. *cap.* 7. *p.* 50. *Fig. E.*

and

and passing through the *Chiltern* Woods, came to *Oxford* and burnt it[h], erecting perhaps this *fortified Barrow* in the way, where 'tis like they might meet with some opposition, and loose some principal *Captain*. As also upon *Shotover-hill*, where there seems to have been two other little *Barrows*, on the left hand of the road from *Oxford* to *London*, that should I confess have been mention'd before in §. 51. of this *Chapter*.

79. But as for the large square *Entrenchments* on *Callow-hills* in the Parish of *Stunsfield* (which yet 'tis possible too may have been an old *British town*, such as described by *Cæsar*, *Oppidum vocant cum sylvas impeditas vallo atque fossâ munierunt*[i], it being much larger than any of the rest, and having deep *holes* within, I suppose, to preserve *water*) the small *Fortification* under *Cornbury* Park-wall, and the large one called *Beaumont*, near *Mixbury*-Church, encompassed with a ditch 170 paces one way, and 128 the other; I can give no account of *them*, but that in general 'tis like they were *works* of the *Saxons*, these being all *square*, though the *last* by its name should indeed be *Norman*.

80. And so again for the *Fortification* commonly called *Round-castle*, west of *Begbrook* Church, but in the Parish of *Bladen*, and *Lineham Barrow* (between which and *Pudlycot*, a Seat of the ancient Family of the *Lacy*'s, there is a passage under ground down to the *river*) I can say little of them, but that in general 'tis most probable they were made by the *Danes* (they being both *round*) but upon what particular occasion, I could no where find.

81. Beside the *circles* of *Earth* cast up by the *Danes*, there are others of *stone* in many places of this *Nation*, and particularly *one* here in the very bounds of *Oxford-shire*, near *Chipping-norton*, in the Parish of *Little Rollwright*, the *stones* being placed in manner and form, and now remain as exactly engraven *Tab.* 16. *Fig.* 2222, in a *round* of 'twixt 30 and 40 paces over; the tallest of *them* all (which may be a *scale* for the rest) being about seven foot high. North of these, about a Bolts-shoot off, on the other side the hedge, in the County of *Warwick*, stands one singly alone, upwards of nine foot high, in form as described *Fig.* 1. and Eastward five others, as in *Fig.* 3. about two furlongs off,

[h] *Simeon Dunelmensis, de gestis Reg. Ang. in Anno* 1010. [i] *Julii Cæsaris Commentarior. de bello Gallico, lib.* 5.

the

the higheſt of *them* all about nine foot alſo; meeting formerly at the top (as drawn by Mr. *Camden*) with their tapering ends, almoſt in ſhape of a *wedge*, ſince whoſe time there are two of them fallen down from the reſt. Of which ancient *Monument* (or what ever elſe it be) he gives us in brief this following account [k].

82. Not far from *Burford* (he ſhould have ſaid *Chipping-norton*; for *Burford* cannot be leſs then 7 or 8 miles from it) upon the very border of *Oxford-ſhire*, is an ancient *Monument*, to wit, certain huge ſtones placed in a *circle*: the common people call them *Rollrich-ſtones*, and dream they were ſomtimes *men*, by a miraculous *Metamorphoſis* turned into hard ſtones. The higheſt of them all, which without the *circle* looketh into the *Earth*, they call the *King*, becauſe he ſhould have been *King* of *England* (forſooth) if he had once ſeen *Long-Compton*, a little Town lying beneath, and which one may ſee if he go ſome few paces forward.

83. Other *five* ſtanding on the other ſide, touching as it were one another, they imagin to have been *Knights* mounted on *horſe-back*, and the reſt the *Army*. Theſe would I verily think, ſays he, to have been the *Monument* of ſome *Victory*, and happily erected by *Rollo* the *Dane*, who afterward conquer'd *Normandy*; for what time he with his *Danes* troubled *England* with *depredations*, we read that the *Danes* joyned Battle with the *Engliſh* at *Hochnorton*, a place for no one thing more famous in old time, than for the woful ſlaughter of the *Engliſh* in that foughten Field under the Raign of King *Edward* the *elder*.

84. That this *Monument* might be erected by *Rollo* the *Dane*, or rather *Norwegian*, perhaps may be true, but by no means about the time of *Edward* the *elder*; for though it be true enough that he troubled *England* with *depredations*, yet that he made them in the days of King *Alfred*, I think all the ancient *Hiſtorians* agree, *An.* 897. according to *Florilegus* [l], but according to Abbot *Bromton* [m] a much better *Author*, in the year 875, near 40 years before that ſlaughter of the *Engliſh* in King *Edwards* days, as will plainly appear, upon compariſon of *this* with the 75. §. of the ſame *Chapter*.

85. Therefore much rather than ſo, ſhould I think he erected *them*, upon a ſecond Expedition he made into *England*, when he

[k] *Britannia* in *Oxfordſh.* [l] *Matth. Weſtmonaſt. in An. citato.* [m] *Johan. Bromton Abb. Jorn. in vita Alured.*

was called in by King *Æthelſtan* to aſſiſt him (as *Thomas* of *Walſingham* witneſſes) againſt ſome potent *rebels* that had taken *arms* againſt him [n]; whom having vanquiſhed, and reduced into obedience to their *Prince*, and perhaps too ſlain the deſigned *King* of them (who poſſibly might be perſwaded to this *rebellion*, upon a *conditional Propheſie* of coming to that *honor* when he ſhould ſee *Long-Compton*) might erect this *Monument* in memory of the *Fact*; the great *ſingle Stone* for the intended *King*, the *five ſtones* by themſelves for his *principal Captains*, and the *round* for the *mixt multitude* ſlain in the Battle, which is ſomwhat agreeable to the *tradition* concerning them.

86. But if I may give my opinion what I really think of them, (though I do not doubt much but they muſt be a *Daniſh* or *Norwegian monument*) I can by no means allow the *round* or *other Stones* to be *Sepulchral monuments*: For had the *Cirque* of *ſtones* been any ſuch *memorial*, it would certainly have had either a *tumulus* in the middle, like the *monument* near the way to **Birch** in *Seland*, and of **Langbeen River** not far from it [o], and another near **Roeſchild** [*]; or a *ſtone Altar*, as in the notable *monument* of *Harald Hyldetand* near **Leire** in *Seland* [p], placed there, ſays *Wormius* (in another part of his Book) *eo fine ut ibidem in memoriam defuncti quotannis ſacra paragantur*, that they might yearly offer Sacrifices in memory of the defunct, at the place of his inhumation. But neither of theſe are within *Rollright Cirque*, nor could that curious and learned *Antiquary* the Worſhipful *Ralph Sheldon* of *Beoly* Eſq; (one of the nobleſt Promoters of this *deſign*) who induſtriouſly dug in the middle of it (to ſee whether he could meet any *ſymbols* or *marks*, either who might erect it, or for what end or purpoſe) find any ſuch matter.

87. For the very ſame reaſon, it is alſo as certain that it cannot have been any place of *Judicature*, ſuch as was uſed in old time in the *Northern Nations*, whereof there is one ſo great in *Seland*, as deſcribed by *Wormius*, that it takes up no leſs than ſix and forty great *Stones* of ſtupendious magnitude within its circumference [q], and ſo does *Rollright* and more too; but then it has no *ſtone* (nor I ſuppoſe ever had) erected in the *middle* for the *Judge* to ſit on, as thoſe always had. Beſide theſe *Fora*, or

[n] *Tho. de Walſingham Ypodigma Neuſtriæ, ſub initium.* [o] *Olai Wormii Mon. Danic. lib.* 1 *cap.* 3. [*] *Idem lib.* 1. *cap.* 6. [p] *Idem lib.* 1. *cap.* 5. [q] *Olai Wormii Mon. Danic. lib.* 1 *cap* 10.

places

places of *Judicature*, (by the *Danes* called **Tings**) ſeem always to have had their *muniments* of *ſtone*, either of a *Quadrangular* or *Oval* Figure, and not to be entered but at two ſides, as that at **Dzething** mention'd by *Wormius*[r], whereas ours is *circular*, and ſhews no ſigns of ſuch *gates*.

88. Which perhaps might occaſion the Learned Dr. *Charleton*, to judg it rather a *Trophie*, or *Triumphal pile*, ſet up as a *Monument* of ſome great *Victorie*[s], to whom though I cannot but ſomwhat incline, yet am verily perſwaded, that at the ſame time it might ſerve alſo for the *Election* and *Inauguration* of a *King*; and much rather than the great and famous *monument* of **Stone-Heng** on *Salesbury* Plain; the very diſparities betwixt *it* and thoſe in *Denmark*, brought by himſelf[t], being not to be found here.

89. For beſide that it is placed (as all ſuch *Courts* of the *Danes* were) 1. Upon a riſing *ground*, for the advantage of *proſpect* (that the common people aſſembled to confirm the ſuffrages or votes of the *Electors* by their univerſal applauſe, and congratulatory acclamations, might ſee and witneſs the ſolemn manner of *Election*:) 2. Made of huge *ſtones* of no regular Figure. And thirdly, Having no *Epigraph* or *Inſcription* cut or trenched in the *ſtones*, as carrying a ſufficient evidence of its deſignment and uſe, in the *figure* of its *platform*. It is but a *ſingle Cirque* of *ſtones* without *Epiſtyles* or *Architraves*, few of them very high on which the *Electors* might eaſily get up to give their *ſuffrages*, as was uſually done in the *Northern Nations*; whereas **Stone-Heng** is made up of *three circles* at leaſt (ſome ſay *four*) and the *ſtones* of each *circle* joyned with *Architraves*, whereof there is no *example* to be found in thoſe *Countrys*.

90. Now that the *Northern Nations* uſually erected ſuch *Cirques* of rude ſtones for the *election* of their *Kings*, is fully teſtified by *Olaus Wormius*, *Reperiuntur inquit in his oris loca quædam in quibus* Reges *olim ſolenni creabantur pompâ, quæ cincta adhuc grandibus ſaxis, ut plurimum duodecim, conſpiciuntur, in medio grandiore quodam prominente, cui omnium ſuffragiis* Electum Regem *imponebant, magnoque applauſu excipiebant. Hic &* Comitia *celebrabant, & de* Regni *negotiis conſultabant.* Regem *vero deſignaturi* Electores *Saxis inſiſtebant forum cingentibus, decreti firmitudinem pronunciantes*[u], *i. e.* as Engliſhed by Dr. *Charleton*[w].

[r] *Ibidem.* [s] Doctor *Charleton's Stone Heng* reſtored to the *Danes*, *pag.* 46. [t] *Idem pag.* 54. [u] *Ol. Wormii Monument. Danic. lib.* 1. *cap.* 12. [w] *Stone-Heng* reſtored to the *Danes*, *pag.* 48.

91. In this County are beheld certain *Courts* of *Parliament*, in which *Kings* heretofore were ſolemnly elected, which are ſurrounded with great *ſtones*, for the moſt part twelve in number, and *one* other *ſtone* exceeding the reſt in eminency, ſet in the middle; upon which (as upon a *Regal Throne*) they ſeated the new elected *King*, by the general ſuffrage of the Aſſembly, and inaugurated *him* with great applauſe and loud acclamations. Here they held their great *Councils*, and conſulted about affairs of the *Kingdom*: But when they met together to nominate their *Kings*, the *Electors* ſtood upright on the *ſtones* environing the *Court*, and giving their *voices*, thereby confirmed their choice.

92. The very ſame practice of the *Northern Nations*, with the Ceremonies of it, are alſo briefly ſet down by *Saxo Grammaticus*, *Lecturi* Regem *veteres affixis humo Saxis inſiſtere ſuffragiaque promere conſueverunt, ſubjectorum lapidum firmitate, facti conſtantiam ominaturi*[x], *i. e.* that the *Ancients* being about to chooſe their *King*, uſed to ſtand upon *ſtones* fixed in the ground, and thence give their *votes*, by the firmneſs of the *ſtones* on which they ſtood, tacitly declaring the *firmneſs* of their *Act*. Which manner of *election* is alſo proved of them, by *Crantzius*, *Meurſius*, and *Bernhardus Malincort de Archicancellariis*[y].

93. Which places of *election* it ſeems were held ſo *ſacred*, as further teſtified by *Wormius*[z], and out of *him* by Dr. *Charleton*[a], that in times of *peace* the *Candidate King*, was obliged *de Jure* there to receive his *Inauguration*, the place and *ceremonies* being accounted eſſential parts of his *right* to *Soveraignty*, and the *votes* of his *Electors* much more valid and authentick for being pronounced in the uſual *Forum*.

94. But if it happened the *King* fell in a Foreign *expedition* by the hand of the *enemy*, the *Army* preſently got together a parcel of great *ſtones*, and ſet them in ſuch a *round*, as well ſomtimes perhaps for the interment of the *corps* of the deceaſed *King*, as *election* of his *ſucceſſor*. And this, 'tis like, they did, 1. Becauſe they eſteemed an *election* in ſuch a *Forum*, a good addition of *Title*. And ſecond, with all expedition, becauſe by the delay of ſuch *election* too long, irreparable damages many times accrewed to the *Republick* thereupon[b]; which practice of the *Danes* they

[x] *Saxon. Grammatici Hiſt. Danorum, lib.* 1. *ſub initium.* [y] *De quibus vide Olaum Wormium, Mon. Dan. lib.* 1. *cap.* 12. [z] *Ibidem ſub finem.* [a] *Stone-Heng* reſtored to the *Danes, p.* 48. [b] *Ol. Wormii Mon. Dan. lib.* 1. *cap.* 12. *ſub finem.*

both

both confirm, by the *authorities* of *Stephanus Stephanius*, in his *Commentaries* on the firſt Book of *Saxo Grammaticus*'s Hiſtory of *Denmark*, and *Svaningius* a grave and faithful *Writer* of that Nation, though what they cite of the latter (if that be all *he* ſays) ſcarce proves quite ſo much.

95. Beſide the erection of *Stones* in Foreign Nations upon the loſs of one *King*, and *election* of another, what if I ſhould add that its alſo very likely that the ſame might be *done* at the *Inveſtiture* of a *Conqueror* into a new acquired *Principality*: Thus why might not *Rollo*, either being compelled as a *younger brother*, to leave *Denmark* or *Norway*, as was appointed by the *Law* of the former *Kingdom*, and to ſeek *him* a new *ſeat* [c]; or forced from the latter for *Piracy* by King *Harold Harfager*, as in the Chronicle of *Norway* [d]; I ſay, why might not *Rollo* after good ſucceſs againſt thoſe he invaded (as *Walſingham* ſays expreſly he was [e], though in another place) be elected *King* by his *followers*, and be *inaugurated* here, as well as there, within ſuch a *circle* of *ſtones*, which bearing his *name* to this very day, and he being acknowledged both by *Bromton* [f] and *Florilegus* [g] to have beaten the *Saxons*, and to have tarryed in this Nation a whole Winter, it is highly probable he might be.

96. For if we enquire into the *origin* of the name of this *Cirque* of *ſtones*, we ſhall find that **Reich** or **Riic** ſignifies a *Kingdom*, and ſomtimes a *King*, as **Eyn reich fraw**, the *Queen*, or *Kings woman* [h]: Whence 'tis plain, that theſe *ſtones* ſeem ſtill to be called the *ſtones* of *King Rollo*, or perhaps rather of *Rollo*'s *Kingdom*, for it was cuſtomary for them to have ſo many *Cirques* of *ſtones* as *Kingdoms*, though in the ſame *Country*. Thus, as *Wormius* teſtifies, there are three at this day in the *Kingdom* of *Denmark*; one in *Seland*, another in *Schoneland*, and a third in the *Cimbrick* Territory, becauſe theſe were anciently three diſtinct *Principalities*, and under the dominion of as many *Kings* [i], as 'tis certain *England* was alſo about this time.

97. And if this conjecture may be allowed to take place, we are ſupplyed alſo with a reaſon why we have no *tumulus* in or near this *monument*, there being no *King* or eminent *Commander* ſlain, but only a conqueſt of the *enemy* in or near this place, intimated

[c] *Tho Walſingham's Ypodigma Neuſtriæ in principio.* [d] *Vid. Chronicon. Norwegicum.* [e] *Tho. Walſingham's Ypodigma Neuſtriæ in princip.* [f] *Joh. Bromton Abbat. Jornal. in An.* 875. [g] *Matth. Weſtmon. in An.* 897. [h] *Vid. Petri Daſypodii Dictionar. Lat. German. in verb. Regno.* [i] *Ol. Wormii Mon. Dan. lib.* 1. *cap* 12.

by

by the *five ſtones* meeting in a point at the top; which perhaps may be the diſpoſition intended by *Saxo Grammaticus*, and out of him by *Wormius*, *Cuneato ordine*, which he ſays expreſly ſignified, *Equeſtrium acies ibidem, vel prope, fortunatius triumphaſſe* [k] *i.e.* that Knights or Horſe-men there, or near the place, obtained a glorious Victory.

98. Yet againſt this conjecture I fore-ſee there lye two *objections* worth removal. 1. That in theſe *Cirques* of *ſtones* deſigned for the *election* of *Kings*, there was always a **Kongſtolen** moſt times bigger than the reſt placed in the middle of it, as intimated above, §. 90. And ſecondly, that had this place been at firſt deſigned for the Inauguration of a *Daniſh* or *Norwegian* King, and ſuch places been ſo eſſential to a good *title*, as pretended above, §.93. certainly all the Kings of the *Daniſh* race that reigned after here in *England*, would have been either crowned here, or at ſome other ſuch *Forum*; whereas we have no ſuch **Kongſtolen** in the middle of the *Cirque*; and beſide, find *Canutus* with great ſolemnity Crowned at *London*, *Harold Harefoot* here at *Oxford* (not far from this *Cirque*) and *Hardi-Canute* likewiſe at *London*.

99. To which it may be replyed, that though not placed in the *Cirque*, yet here is a **Kongſtolen** not far off, which 'tis like was not neceſſary ſhould be ſet within it; for I find the *place* where the new *elected* King ſtood and ſhewed *himſelf* to the people, at the *Forum* for this purpoſe at **Leire** in *Seland*, to have been without the *Area*, as our **Kongſtolen** is. *Area ſaxis undique cincta Coronationi Regum deputata vicinum habet Collem, cui Coronatus jam inſiſtebat jura populo daturus, & omnibus conſpiciendum ſe præbiturus* [l], *i. e.* that the *Area* encompaſſed with *ſtones* deſigned for the Coronation of their Kings, had a Hill near it, whence the new Crowned King gave *Laws*, and ſhewed *himſelf* to the *people*; it ſeeming indifferent from hence, and another ſuch like *hillock* called **Trollebarolhoy**, whereon the King alſo ſtood, at the place of ſuch *election* near *Lundie* in *Scania* [m], whether he aſcended a *ſtone* or *mount* of *earth*; within, or without the *Area*, ſo he thence might be ſeen and heard by the *people*.

100. And to the ſecond Objection it may be reaſonably anſwered, that the *Danes* by this time having gotten the whole Kingdom, and ſuch capital Cities as *London* and *Oxford* were,

[k] *Idem lib.* 1. *cap.* 9. [l] *Idem lib.* 1 *cap.* 5. [m] *Idem lib.* i. *cap* 12.

might

might well change the places of their *Coronations*: Beſide, *Canutus* and the reſt were much greater perſons, and more civilized than *Rollo* and his *crew*, can be preſumed to have been; for beſide that he lived above a hundred years before them, we find him (though the ſon of a *Norwegian* Jarl, or *Earl*) a great *Pyrate* at Sea [n], and little better then a *Robber* by Land; well might he therefore be contented with this *Inauguration*, after the old barbarous faſhion, having gained no *City* wherein it might be done with greater ſolemnity.

101. But as for the *ſtones* near the *Barrow* at *Stanton-Harcourt*, called the *Devils Coits*, I ſhould take them to be *appendices* to that *Sepulchral Monument*, but that they ſeem a little too far removed from it; perhaps therefore the *Barrow* might be caſt up for ſome *Saxon*, and the *ſtones* for ſome *Britans* ſlain hereabout (*aut vice verſa*) at what time the Town of Eignerham, about a mile off, as *Camden* informs us, was taken from the *Britans* by *Cuthwolf* the *Saxon* [o]. Which is all I can find worthy notice concerning them, but that they are about eight foot high, and near the *baſe* ſeven broad; and that they ſeem not *natural*, but made by *art*, of a ſmall kind of *ſtones* cemented together, whereof there are great numbers in the Fields hereabout; which makes thus much for the conjecture concerning thoſe at *Stone-Heng*, that they may be *artificial*, it being plain from theſe, that they could, and did do ſuch things in the ancienter times.

102. There ſtands alſo a ſtone about half a mile South-weſt of *Enſton* Church, on a Bank by the way-ſide between *Neat-Enſton* and *Fulwell*, ſomwhat flat, and tapering upward from a broad bottom, with other ſmall ones lying by it; and another near the road betwixt *Burford* and *Chipping-norton*, which I gueſs might be erected for the ſame purpoſe with the two former, as above-mention'd: Unleſs we ſhall rather think, both *theſe* and *them* to have been ſome of the *Gods* of the ancient *Britans*, as the Reverend and Learned Dr. *Stillingfleet* thinks it not improbable thoſe *Pyramidal ſtones*, mention'd by *Camden* in *York-ſhire*, called the *Devils bolts* [p], ſomtimes were. And ſo likewiſe *Stone-Heng* in *Wiltſhire*, which he judges neither to be a *Roman Temple*, nor *Daniſh Monument*, but rather ſomwhat belonging to the Idol *Marko-*

[n] *Vid. Chronicon. Norwegicum.* [o] *Vid. Camd. Britan. in Oxfordſh.* [p] *Idem in Com. Ebor.*

lis,

lis, which *Buxtorf* ſaith the *Rabbins* called בית קולים *domum Kolis*[q]; of which more hereafter when I come into that *County*; and into *Kent*, where of *Kits-coty-houſe*, which I take to be an *Antiquity* of the ſame kind.

103. That the *Britans* long before the arrival of the *Romans*, were acquainted with the *Greeks*, has ſufficiently I gueſs been made appear already, §. 66. of this *Chapter*; and that long before that they were known to the *Phænicians*, and all the *Eaſtern* Countries, is plain out of *Strabo*[r], and *Bochartus*[s], and by compariſon of the *Learning* and *Religion* of the *Druids*, with thoſe of the *Indian Brachmans*. Now that it was the ancient cuſtom of all the *Greeks* to ſet up *unpoliſh'd ſtones* inſtead of *Images*, to the honor of their *Gods*, we have the teſtimony of *Pauſanias* in theſe words, τὰ ὄπ παλαιότερα, ἐς τοῖς πάσιν Ελλεσι, τιμὰς θεῶν ἀντὶ ἀγαλμάτων εἶχον ἄργοι λίθοι[t]. *i. e.* that *unhewn ſtones* amongſt all the *Græcians*, had the honor of *Gods* inſtead of *Images*; more particularly the ſame *Author* aſſerts, that near the *Statue* of *Mercury* there were 30 ſquare ſtones, τετράγωνοι λίθοι τριάκοντα, which the *Pharii* worſhipt, and gave to every one of them the name of a *God*[u].

104. That the *Arabians* and *Paphians* alſo worſhip'd ſuch like *Gods*, is likewiſe witneſſed by *Maximus Tyrius*. Ἄραβοι σέβουσι μὲν, ὅντινα δὲ οὐκ οἶδα· ὃ δὲ ἄγαλμα ὁ εἶδον, λίθος λῶ τετράγωνος. Παφίοις ἡ μὲν Ἀφροδίτη τὰς τιμὰς ἔχει, ὃ δὲ ἄγαλμα οὐκ ἂν εἰκάσαις ἄλλῳ τῳ ἢ πυραμίδι λευκῇ[w]. *i. e.* that the *Arabians* worſhip'd he ſcarce knew what *God*, but that he ſaw amongſt them was only a *ſquare ſtone*; and that the *Paphians* worſhip'd *Venus* under the repreſentation of a *white Pyramid*.

105. And *Herodian* deſcribing the *Worſhip* of *Helægabalus* at *Emeſa* in *Phænicia*, ſaith, that he had no kind of *Image* after the modern *Greek* or *Roman* faſhion made by mens hands, λίθος δέ τις ἐστὶ μέγιστος, κάτωθεν φερὴς, λήγων εἰς ὀξύτελα, κωνοειδὲς ἀπὸ σχῆμα[x], *i. e.* but a *great ſtone* round at the bottom, and leſſening by degrees toward the top, after the manner of a *Cone*. To which add, that *Peter della Valle*, in his late Travels into the *Indies*, ſaith, that at *Ahmedabad* there was a famous *Temple* of *Mahadeu*, wherein there was no other *Image* but a little *column* of ſtone af-

[q] *Joh. Buxtorfii Lex. Talmud. in v. Markolis.* [r] *Strabonis Geographiæ, lib. 3. pag. 175. Edit. Iſ. Caſaub. Paris, An. 1620.* [s] *Sam. Bocharti Geog. Sacr. part. 2. lib. 1. cap. 39.* [t] Παυσανίου Αχαϊκ. *pag. 228. Edit. Sylburg.* [u] *Ibidem.* [w] *Max. Tyrii Diſſert. Philoſoph. 38. p 384. Edit. Dan. Heinſii.* [x] *Herodiani Hiſtoriar. lib. 5. pag. 114. Edit. Hen. Stephani.*

ter

ter a *Pyramidal* form; which *Mahadeu*, he ſaith, in their Language ſignifies the great *God*[y]. And after this faſhion, he ſaith, 'tis the cuſtom of the *Brachmans* to repreſent *Mahadeu*[z].

106. All which being put together, eſpecially as recommended by ſo Learned a Perſon as the Reverend Dr. *Stillingfleet*, have prevailed with me much: However, the *Reader* is free to uſe his judgment, whether they are *memorials* of the *dead*, as commonly thought, or repreſentations of the *Deities* of the ancient *Britans*, given them by ſome Companions of the Eaſtern *Merchants*, trading hither for *Tin*, to the *Caſſiterides*.

107. Other *Antiquities* contemporary with the *ſtones* above-mentioned, I met with none here in *Oxford-ſhire*, but thoſe three *Rings* lincked one within another, and engraven by miſtake a little out of their place, *Tab.* 16. *Fig.* 4. for that they are not like to be *Britiſh* or *Roman*, I think is pretty certain. The *Britans*, 'tis true, uſed *Rings* inſtead of *Mony*, yet as *Cæſar* teſtifies, they were only of *Iron*[a]. And though the *Romans*, amongſt their other *dona militaria*, did uſually give *Calbeos*[b], *ſive armillas*, *bracelets*, yet they were conſtantly I find, either of *gold* or *ſilver*; whereas *ours*, as in number, are of three different materials; the largeſt *copper*, the ſecond *iron*, and the leaſt *green glaſs*, or ſome *ſtone* of that colour.

108. It remains they muſt therefore be either *Saxon* or *Daniſh*, but whether of the two, we muſt not hope to determin, ſince we find ſuch *rings* uſed by both *Nations*. That the *Saxons* had ſuch *bracelets*, is plain from King *Ælfred*, who notwithſtanding he came to the Kingdom, long habituated as it were to *rapines* and *murders*, yet brought it before his death into ſo good a poſture, (as is learnedly made out, and by what degrees he did it, in that excellent *Hiſtory* of his *Life*, now in the *Preſs*) that he could, and did hang up ſuch *bracelets* of *gold* in the high-ways, which no *Traveller* dared touch. Ælfredus *per publicos aggeres, ubi ſemitæ finduntur in quadrum, Armillas jubebat aureas appendi, ut Viantium aviditatem irritaret, cur non eſſet qui eas acciperet*, ſays *Florilegus* of him[c]. Where, by the way, perhaps it may not be amiſs to note, that theſe *Rings* were drawn out of the River *Cherwel* with a Fiſhing-net, near *Hampton Gay*, not far from the meeting of

[y] *Pet. della Valle Viaggi, p.* 3. *Lett.* 1. §. 15. *p.* 107. [z] *Ibidem.* [a] *Jul. Cæſaris Comment. de bello Gallico, lib.* 5. [b] *Vid. Sexti Pomp. Feſti, Fragment. libro* 3. [c] *Matth. Weſtmon. Flores Hiſt. in An.* 892.

ſuch ways at *Kirklington*, and kindly beſtowed on me by my worthy Friend Mr. *Barry*, amongſt ſome other matters of like nature, though not ſo fit to be mention'd here.

109. And that the *Danes* alſo made the ſame *Experiment* of the innocency of their people, and of univerſal peace & freedom from rapine, is as manifeſt out of *Saxo Grammaticus*, who ſays expreſly of *Frotho the Great*, *Ut uniuſcujuſque rem familiarem à furum incurſu tutam præſtaret, Armillam unam in Rupe, &c*[d]. *i. e.* that he might preſerve every mans Goods from the ſpoils of *thieves* and *robbers*, hung up a *bracelet* of *gold* on the *rock* called after his own name, *Frothonis petram*; and another in the *Province* of *Wig*, threatning great ſeverity to the *Preſidents* of thoſe *Countries*, if they ſhould be taken away. They uſed them alſo (like the *Romans*) as *rewards* of *valour*, as appears from the proffer of King *Roricus*, of his *ſix bracelets* to any man that would undertake the *Champion* of the *Sclavi* (his Enemies) challenging any man in his Army[e]; and ſomtimes too as *rewards* of *Wit*, as the ſame *Author* informs us, *Wiggo* being honor'd with a great *Armilla* by *Rolvo Krage*, for a Jeſt[f]; and *Refo*, by *Goto* King of *Norway*, *ideo tantum quod eum cultius & familiarius habuiſſet*[g].

110. Theſe *Armillæ*, the *Danes* and other Northern *Nations* accounted ſo ſacred, that as *Bartholin* informs us out of *Arngrimus*, the *Iſlanders* uſually ſwore upon them, *Cujus religionis fuit ritus, ut juramentum præſtituri, adhibitis teſtibus Annulum in Ara Deorum aſſervari ſolitum, & in foro Judiciali à Judice ſupremo in brachio geſtatum, hoſtiarumque ſanguine illinitum, attrectarent*[h], *i. e.* that the manner of people to be *ſworn* was, that before *witneſs* they ſhould lay their hands on a certain *Ring*, uſually kept upon the *altar* of their *gods*, worn upon the arm of the *Chief Juſtice* (whence 'tis plain it was an *Armilla*) and ſmeared over with the blood of their *Sacrifices*. And *Ethelwerdus* and *Aſſerius* both acquaint us, that King *Ælfred* having gotten conſiderable advantage over the *Danes*, made them ſwear (beſide on his own *Reliques*) *in eorum Armilla ſacra, quod cæterarum Regionum* Regibus *fecere nunquam*[i], *i. e.* upon their holy *bracelet*, which they had never done before to the Kings of any other *Nation*.

[d] *Saxon. Gram. Hiſt. Dan. lib. 5. p. 46. Edit. Operin.* [e] *Idem lib. 3. pag. 24. D.* [f] *Idem lib. 2. pag. 16 C.* [g] *Idem lib. 8. pag. 83. C.* [h] *Tho. Bartholini Schedion de Armillis veterum, §. 7. p. 98.* [i] *Chronicorum Ethelwerdi, lib. 4. in An. 876. vid. etiam Aſſerium Meneveni. in eodem An.*

111. Which

111. Which *Armillæ* it ſeems were ſomtimes ſingle, and ſomtimes curiouſly link'd together. Thus the *ſix bracelets* of King *Roricus* above-mentioned, are ſaid to have been, *ita mutuis nexibus involutas ut ab invicem ſequeſtrari nequirent, nodorum inextricabiliter ſerie cohærente* [k], *i. e.* ſo inextricably involved one within another, that there was no parting them. The Learned *Bartholin* alſo informs us, that ſomtimes the *Armilla* had a *Ring* hung to it. *Eſt tamen Armillæ ſuus quandoque circulus* [l]: And that when *rings* are thus hung to *bracelets*, there is always ſome *myſtery* in it, *quod annuli Armillis fere jungantur non caret myſterio* [m]. Where by *Armillæ* he means ψέλια, or περιάρματα, *ornaments* for the *wriſts*, and by *annuli* and *circuli*, *ornaments* for the *fingers*: *Armillæ id brachio præſtant, quod digitis annuli* [n], *i. e.* that *bracelets* have the ſame uſe on the *wriſt*, that *rings* have on the *finger*.

112. Now that ours was an *Armilla*, is plain enough, for that the great *Copper* ring is of ſomwhat above three inches *diameter*, and big enough to encompaſs any ordinary mans wriſt; the leſſer *iron* one, and *green ring* of *glaſs*, being additional *ornaments*, eſpecially the latter, which queſtionleſs was put on to repreſent an *Emrauld*; that ſort of *Stone*, as *Pignorius* and *Bartholin* both teſtifie, being much uſed in *bracelets* [o]: which makes me think it the *bracelet* but of ſome ordinary perſon, the *Armilla* it ſelf being *copper*, with which, ſaith *Bartholin*, only the vulgar adorned themſelves, *Armillæ æreæ, plebeæ cenſendæ ſunt* [p], and the *appendent glaſs* but a counterfeit *Jewel*.

113. For eminent places in this *County*, during the Government of the *Saxons* and *Danes* in *Britan*, we may reckon firſt *Banbury*, then called Banerbyrig, where *Kenric*, the ſecond *Weſt-Saxon* King, about the year 540, put to flight the *Britans*, fighting for their lives, eſtates, and all they had [q]. After the *Conqueſt*, about the year 1125. it was ſtrengthned with a *Caſtle* by *Alexander* the then great Biſhop of *Lincoln*; and ſince that, *Jan.* 26. 1° *Mariæ*, made a *Burg* or *Burrough* conſiſting of a *Bayliff*, 12 *Aldermen*, and 12 *Burgeſſes*, in recompence of their faithful ſervice done to the ſaid Queen *Mary* (as 'tis expreſt in their *Charter*) in manfully reſiſting *John* Duke of *Northumberland* that rebelled againſt her; whence 'tis plain this *Town* was ever *zealous* in matters of

[k] *Sax. Gram. Hiſt. Dan. lib.* 3. *p.* 24. *D. Edit. Operini.* [l] *Tho. Bartholin. Schedion de Arm. Vet.* §. 4. *p.* 41. [m] *Idem* §. 4. *in princip.* [n] *Ibidem.* [o] *Vid. Laurentium Pignorium de Servis. Et Bartholin. Schedion de Armill.* §. 3. *p.* 37. [p] *Idem* §. 3. *de Armillarum materiâ, p.* 32. [q] *Camd. Britan. in Oxf.*

Religion, of what perſwaſion ſoever they were, heretofore as well as now. Since again on the 8 of *June*, *Jac.* 6, it was made a *Major Town*, conſiſting of a *Major*, 12 *Aldermen*, and 6 *Capital Burgeſſes*.

114. And ſecondly, *Benſon*, alias *Beneſingtune* *, which *Marian* (ſays *Camden*) calls *villam Regiam*, the Kings *Town*, and reporteth that *Ceaulin*, the third King of the *Weſt-Saxons*, about the year 572, took it from the *Britans*, which his ſucceſſors kept 200 years after, till they were diſpoſſeſt again by *Offa* the great King of the *Mercians* [r]. And thirdly, though *Dorcheſter* has its name from the *Britiſh Dour*, which ſignifies *water*, and therefore called by *Leland*, *Hydropolis*; and ſeems to have been known to the *Romans* by the *mony* found thereabout, and the *Latin* termination *Ceſter*, which, ſays *Leland*, the *Saxons* applyed to *Cities* as well as *Fortifications* [s]; yet it never came to its height till *Birinus*, *an.* 614. was ſeated there as Biſhop of the *Weſt-Saxons*, by Cynigelſe their King, whom he had newly Baptized, and *Oſwald* King of *Northumberland*, God-father to *Cynigelſe* [t].

115. About this time the Town of *Berenceſter*, alias *Berncester*, in *Saxon* Bupenceaꝛtep, and Bepnaceaꝛtep, which I take to have been its *primitive* names, ſeems alſo to have been raiſed, and to have taken its name, as ſome have thought, from the ſame Biſhop *Birinus*, *quaſi Birini caſtrum*: But I much rather believe it ſo called from *Bern-wood*, or Forreſt, mention'd by *Bede* [u], *Florilegus*, and *Wigornienſis* [w], upon the edge whereof it was then ſeated, nor is now far off it; after which perhaps from St. *Eadburg*, to whom the *Priory* there was, and *Pariſh Church* is now dedicated, it changed its name to *Burgceſter*, and ſince that to *Burceſter*, now *Biſſeter*.

116. The Town of *Burford*, in *Saxon* Beopꝛopo, ſeems alſo to have been a place of good *Antiquity*, but moſt remarkable for a *battle* fought near it, about the year 750 [x], perhaps on the place ſtill called *Battle-edge*, Weſt of the Town betwixt *it* and *Upton*; between *Cuthred* or *Cuthbert*, a tributary King of the *Weſt-Saxons*, and *Ethelbald* the *Mercian*, whoſe inſupportable exactions the former King not being able to endure, *he* came into the Field againſt

* *Will. Malmesburienſ. de geſtis Reg. Ang. lib.* 1. *cap.* 2. [r] *Camdeni Britan. in Com. Oxon.* [s] *Lelandi Comment. in Cygneam Cant. in v. Hydropolis.* [t] *Ven Bedæ Hiſt. Eccleſiæ Gent. Ang. lib.* 3. *cap.* 7. [u] *Chronologia Saxonica, in An.* 921. [w] *Mat. Weſtmon. & Florent. Wigorn. in An.* 918. [x] *Rog. Hoveden Annal. Part. priori in An. citat.*

him,

him, met, and overthrew *him* here about *Burford*, winning his *Banner* wherein there was depicted a *golden Dragon* [y]; in memory of which *Victory*, perhaps the *custom* (yet within memory) of making a *Dragon* yearly, and carrying it up and down the *Town* in great *jollity* on *Midsummer* Eve, to which (I know not for what reason) they added a *Gyant*, might likely enough be first instituted.

117. After the *Conquest*, I find it the Town of *Robert* Earl of *Glocester*, base Son to King *Henry* the First, to whose Son *William* I have seen an *Original Charter* granted him by King *Henr.* 2. giving to this his Town of *Bureford*, *Gildam & omnes consuetudines quas habent liberi Burgenses de Oxeneford*; most of which it has since lost, and chiefly by the over-ruling power of Sir *Lawrence Tanfield*, Lord chief Baron in Queen *Elizabeths* time: Yet it still retains the face of a *Corporation*, having a *common Seal*, *&c.* the very same with *Henley*, as described in the *Map*, if they differ not in *colours*, which I could not learn.

118. As for *Wudustoke*, or *Wudestoc*, *Sax.* pubertoc (*i. e. locus sylvestris*) now *Woodstock*, it seems to have been a *seat Royal* ever since the days of King *Ælfred*, it appearing by a MS. in Sir *John Cotton*'s Library, that he translated *Boetius de Consolatione Philosophiæ*, there [z]. Nay, so considerable was it in the time of King *Ætheldred*, that he called a *Parliament* there, and Enacted *Laws*, to be seen amongst that *collection* of ancient *Laws* set forth by Mr. *Lambard* [a]. Whence it may almost be certainly concluded, that here must have been a *house* of the Kings of *England*, long before the days of King *Henry* the First; who yet 'tis like indeed was the first that inclosed the *Park* with a *wall*, though not for *Deer*, but all foreign *wild Beasts*, such as *Lyons*, *Leopards*, *Camels*, *Linx*'s, which he procured abroad of other *Princes*; amongst which more particularly, says *William* of *Malmesbury*, he kept a *Porcupine*, *hispidis setis coopertam*, *quas in Canes insectantes naturaliter emittunt* [b], *i.e.* cover'd over with sharp pointed *Quills*, which they naturally shoot at the *dogs* that hunt them.

119. Of the Town of *Thame*, anciently Tamerpopea, I could find little, till about the time of *Edward Senior*, An. 921, when the *Danish* Army out of *Huntingdon* came hither and erected some

[y] *Camd Britan in Com. Oxon.* [z] *MS. in Biblioth. Cottonianâ, sub Othone A* [a] Αρχαιονομια *Gul. Lambard, fol.* 82. [b] *Will. Malmesburiens. de Henr.* 1. *lib.* 5.

kind

kind of *Fortification*; but at this time it ſeems it was ſo conſiderable, that it had the reputation of a *Burg*; for King *Edward* coming againſt it the ſame year, his *Army* is ſaid to have beſieged the *Burg* and taken it, and to have ſlain the *Daniſh* King, Earl Toglor, and Earl Oannan his *ſon*, his *brother*, and all others whatever within the *Town* [c]. And again, *An.* 1010. when the *Danes* over-ran moſt of this part of *England*, we find this Town amongſt others to have ſuffered much by them [d].

120. *Chippingnorton*, anciently Ceapan-neptune, was alſo moſt certainly a Town of note in the *Saxons* days, as one may gather from its name, it being ſo called from Ceapan *Emere*, to buy or *cheapen*, ſo that it implies as much as *Mercat Norton*, or *Norton* where the people uſually *cheapened* Wares. And *Whitney*, now *Witney*, ſeems to have been a Town of good repute before the *Conqueſt*, it being given about the year 1040. to the Church of St. *Swithins Winton*: with eight other *Manors*, by *Alwinus* then Biſhop of that *See*, who for his over-familiarity with *Emma* Mother to K. *Edward* the *Confeſſor*, was cauſeleſly ſuſpected of *Adultery* with *her*: Of which ſuſpition Queen *Emma* purging herſelf and him by the *Fire Ordeal*, of walking bare-foot over nine *red-hot plough-ſhares* without hurt; in thankfulneſs ('tis ſaid) they each gave nine *Manors* to the Church of *Wincheſter*, which are all named by Mr. *Dugdale*, *Witney* being one of thoſe given by *Alwinus* [e].

121. And the neighboring Town of *Bampton*, anciently Bemtune, ſeems to be of much about the ſame *antiquity*, yet neither can I find any higher *Record* of it, than of *Leofric* Chaplain to King *Edward* the *Confeſſor*, who *An.* 1046. upon the union of the Biſhopricks of *Criditon* and *Cornwal*, and both of them tranſlated to *Exeter*, whereof he was made the firſt *Biſhop*, quickly after gave to this his new *Church* his land æt Bemtune [f], to which it belongs to this very day.

122. Which is all I could meet with of the Towns of *Oxfordſhire* before the *Conqueſt* (for after long ſearch I could find nothing of *Deddington*, till about the Reign of King *Edw.* 2. whereof when I come to ſpeak of the *Caſtle* there) concerning which I could have added much more, and brought their *Hiſtory* down

[c] *Chronologia Saxonica, in An.* 921. [d] *Joh. Bromton Abb. Jornal. in An. citat.* [e] *Monaſtici Anglicani, vol.* 1. *inter Addenda, pag.* 980. [f] *E Cod. vet. MS. in Bib. Bod. fol. Med.* 120. *in princip.*

to

to theſe times, as above in *Banbury*; only *that*, and whatever elſe is worthy notice of them, may be found in ſome other *modern Hiſtories*.

123. Yet before we come to the *times* ſince the *Conqueſt*, let us firſt remember that the Town of *Iſlip*, *Sax.* Gihtþlepe, or Gibtþlepe, muſt needs be of good repute in thoſe days, for *Camden* ſays expreſly, and ſo do ſeveral other *Authors*, that King *Edward* the *Confeſſor* was born there, which they prove from his original *Charter* of *Reſtoration* of the *Abby* of *Weſtminſter*, wherein he gives to this his new *Church* the Town of *Iſlip*, with the additional Clauſe of [*the place where he was born*[g]] which though, 'tis true, I could not find in Mr. *Dugdale*[h], yet here remaining ſome foot-ſteps of the ancient *Palace*, and a *Chappel* now put to profane uſe, called the Kings *Chapel*, and the *Town* ſtill belonging to the Church of *Weſtminſter*, there is no great doubt to be made of the thing, *tradition* it ſelf being not like to be erroneous in a matter of this nature, though there were no ſuch *Charter* to prove the thing alleged, which yet we have reaſon to believe there is, or was, though not produced by Mr. *Dugdale*.

124. In the *Chapel* above-mentioned, not many years ſince, there ſtood (as was conſtantly deliver'd down to poſterity) the very *Font*, wherein that Religious Prince, St. *Edward* the *Confeſſor*, received the *Sacrament* of *Baptiſm*: which, together with the *Chapel*, in theſe latter days being put to ſome indecent at leaſt, if not profane uſe, was carefully and piouſly reſcued from it, by ſome of the Right Worſhipful Family of the *Browns* of *Nether Kiddington*, where it now remains in the *garden* of that worthy Gentleman Sir *Henry Brown* Baronet, ſet handſomly on a *pedeſtal* as exactly repreſented *Tab.* 16. *Fig.* 6. and adorned with a *Poem* rather pious than learned, which yet I think I had put down, but that it is imperfect.

125. Which holy King *Edward* was the firſt to whom was granted the gift of *Sanation*, only with the touch of his hand, of the Diſeaſe called the *Struma*, or *Scrofula*, and in Engliſh upon this account, the *Kings Evil*; which as a mark of *Gods* moſt eſpecial favor to this *Kingdom*, has been tranſmitted with it, as an *hereditary gift* to all his *Succeſſors*: Every *ſacred* hand in all Ages ever ſince, that has held the *Scepter* of this moſt happy and now flo-

[g] *Camd. Britan. in Com. Oxon.* [h] *Vid. Monaſticon Angl. vol.* 1. *p.* 59.

riſhing

riſhing *Kingdom*, having been ſignally bleſt by divers and undoubted *Experiments* of healing that Diſeaſe.

126. Before they *touch* for this diſtemper, they have always *Prayers* read ſutable to the *occaſion*, both which when performed, the King forthwith beſtows on every *Patient*, a piece of *Angel-gold* purpoſely coined, and put upon a *white ribbon* to be hung about the neck; which as long as worn preſerves the virtue of the *touch*, though Dr. *Tooker* will have it only, *Sanitatis ſymbolum inchoatæ, & Eleemoſynæ ſacræ monumentum*[i], *i. e.* a mark that the *Cure* is already begun, and a laſting memorial of the Kings charity and piety to the poor *patients*.

127. However it be, that this was the cuſtom *ab initio*, I take to be plain from that piece of *Gold* of King *Edward* the *Confeſſor*, *Tab.* 16. *Fig.* 5. found in St. *Giles*'s field in the Suburbs of *Oxon.* having the *initial letters* of his name over the hinder part of the head, and two ſmall *holes* through it, as if deſigned to be hung on a *ribbon* for the purpoſe above-mention'd, the *holes* being ſtrengthened with Gold *Wire* faſtened round them, and to the piece it ſelf, much after the faſhion of the *eye* of a mans doublet, as exactly deſcribed in the Figure, *ut ſupra*; which piece was lent me by that courteous Gentleman Sir *John Holeman* Baronet, in whoſe poſſeſſion it now remains at his Houſe near *Northampton*.

128. From King *Edward* the *Confeſſors* being born at *Iſlip*, 'tis eaſie to collect, that his Father King *Æthelred* muſt neceſſarily have had a *Royal Seat* there, as in all probability likewiſe at *Heddington* near *Oxford*; for though Tradition now goes, that it was but the *Nurſery* of the Kings Children, whereof there remains yet upon the place ſome ſigns of foundations in a Field near the Town, called *Court-cloſe*; yet it is plain, that King *Æthelred* did ſomtimes at leaſt reſide there himſelf, for he concludes a *Charter*, or ſome ſuch like *Inſtrument*, wherein he grants *Privileges* to the Monaſtery of St. *Frideſwide* here in *Oxon.* of his own *Reſtoration*, in Engliſh thus, **This privilege was idith at Yedinton**, and after in *Latin*, *Scripta fuit hæc Cedula juſſu præfati Regis in villa Regia quæ ..... appellatur, die octavarum beati Andreæ Apoſtoli, his conſencientibus p ..... qui ſubtus notati videntur. Ego* Æthelredus *Rex hoc privilegium, &c*[k].

[i] *Gul. Tookeri Chariſma ſive donum Sanationis, Reg. Ang. cœlitus conceſſum.* [k] *Monaſticon Anglican. Vol. I. inter adde[illegible]*

129. Beſide *theſe*, the Kings of *England* had ſeveral other *ſeats* within this *County* (not to mention again that *Woodſtock* was one, or that old *Alceſter* was the *ſeat* of *Alectus*) ſuch as *Beaumont*, juſt without the *ſuburbs* of *Oxford*, the Birth-place of the valiant King *Richard* the Firſt. *Langley*, upon the edge of the *Foreſt* of *Whichwood*, a ſeat, as Tradition has deliver'd it down to us, of the unhappy King *John*, who perhaps during the time of his *Reſidence* here, might indeed build the Caſtle of *Bampton*, which alſo Tradition informs us was of his *foundation*. And *Ewelm*, built indeed by *William De la Pool* Duke of *Suffolk*, who marrying *Alice* the daughter and heir of *Thomas Chaucer*, had a fair Eſtate hereabout; but after, upon the attaindure of *John* Earl of *Lincoln*, and *Edmund* his brother, Grand-children to the Duke, it came to the *Crown* in the days of King *Henr.* 7. and was afterward made an *Honor*, by laying unto it the Manor of *Wallengford*, and ſeveral others, by King *Hen.* 8. All which *houſes* are mark'd out in the *Map*, by the addition of a ſmall Imperial *Crown* placed ſomwhere near them.

130. As all places that gave title to ancient *Barons*, moſt of whoſe Families long ſince have been extinguiſh'd, are mark'd with a *Coronet*; ſuch are, 1. The *Baronies* by ancient *Tenure*, which were certain *Territories* held of the *King*, who ſtill reſerved the *Tenure* in *chief* to himſelf: whereof the ancienteſt in this County were thoſe of *Oxford* and St. *Valeric*, the head of the latter being the Town of *Hoke-Norton* [e], both given by the *Conqueror* to *Robert D'Oyly* who accompanied *him* out of *Normandy* [f]. 2. The *Barony* of *Arſic*, belonging to *Manaſſer Arſic*, who floriſh'd *An.* 1103. 3 *Hen.* 1. the head of which *Barony* was *Coggs* near *Witney*, *Summerton* and *Hardwick* in this *County*, being other members of it. 3. The *Barony* of *Hedindon*, now *Heddington*, given the 25 of *Henr.* 2. to *Thomas Baſſet* in *Fee-farm*, whoſe Son *Gilbert* the Founder of *Biſſeter Priory*, in the firſt year of *Richard* the Firſt, was one of the *Barons* that attended at the *Coronation*. And theſe are all the *Baronies* of ancient *Tenure* that were heretofore in *Oxford-ſhire*.

131. In the beginning of the Reign of King *Edward* the Firſt, there were ſeveral other able *men* ſummon'd as *Barons* to *Parliament*, that had not ſuch *Lands* of ancient *Tenure*, as thoſe above

[e] *Camd. Britan. in Com. Oxon.* [f] *Monaſticon. Angl. vol.* 2. *p.*

had, which were therefore ſtiled *Barons* by *Writs* of *Summons* to *Parliament*. The firſt of theſe in *Oxford-ſhire* was *William de Huntercomb* (whoſe *ſeat* ſtill remains by the ſame name in the Pariſh of *Tuffield*) who was ſummoned to *Parliament* by the *Kings Writ*, bearing date the 23 of *Edw.* 1. The ſecond, I find, was *Joh. Gray* of *Rotherfield*, whoſe *Anceſtors* being of a younger Houſe of *Walter Grey* Arch-Biſhop of *York*, had *Rotherfield* given them, beſide many other *poſſeſſions* by the ſaid Arch-Biſhop: He was ſummoned firſt to *Parliament* the 25 of *Edw.* 1.

132. And ſo was thirdly, his next Neighbor *Ralph Pipard* of the other *Rotherfield*, in the ſame year of the ſame *King*, their *ſeats* having now almoſt quite changed their *names*, for thoſe of their *owners*; one of them ſeldom being called otherwiſe than *Pipard* or *Pepper*, and the other *Grays*. Alſo fourthly, *John* Baron *Lovel*, of *Minſter-Lovel*, whoſe *anceſtors* though *Barons* by *tenure* many years before, as ſeiſed of the *Barony* of *Caſtle-Cary* in *Somerſet-ſhire*, yet diſ-poſſeſt of that I know not by what means, received *ſummons* to *Parliament* whil'ſt ſeated here at *Minſter*, 25 of *Edw.* 1.

133. The fifth of theſe *Barons* was *Hen. le Tyes*, who having a grant of *Sherbourn* here in *Oxford-ſhire* from *Richard* Earl of *Cornwall*, *temp. Henr.* 3. which *Sherbourn* had formerly been a part of the *Barony* of *Robert de Druis*, was ſummoned to Parliament the 28 of *Edw.* 1. And ſo was ſixthly, *John de la Mare* of *Garſington*, the very ſame year. To which ſhould be added, the *Barons* by *Letters Patents* of *Creation*, ſo firſt made about the 11 of *Rich.* 2. But of theſe, whoſe *Barony* is now vacant, there is only, ſeventhly, the Lord *Williams*, ſolemnly created Lord *Williams* of *Thame* the firſt of *April*, 1 *Mariæ*, who had alſo *ſummons* the ſame time to the *Parliament* then ſitting, but his *Patent* it ſeems was never enrolled.

134. For this account of theſe *Baronies*, I acknowledge my ſelf beholding to that Learned *Antiquary*, *William Dugdale* Eſq; *Norroy* King at *Arms*, in whoſe elaborate *Volumes* of the *Baronage* of *England*, the *Reader* may receive more ſatisfaction concerning them. Yet beſide theſe, as the people will have it, the *Manor* of *Wilcot* was the head of a *Barony*, one of the *Barons* whereof, as tradition tells them, lies buryed under a fair *Monument* in *North-Leigh* Church: But the Writings of the preſent *Proprietor*, my worthy

worthy Friend Mr. *Cary* of *Woodſtock* (whom yet I found inclined to believe ſome ſuch thing) being at *London*, whereby otherwiſe it poſſibly might have been proved, and the teſtimony of the *people* being too weak an *evidence* to build upon; I have rather choſen to forbear, then add a *Coronet* to the place.

135. Beſide the *Saxon* and *Daniſh* Fortifications above-mentioned, there are others here in *Oxford-ſhire* of a later date, either quite *raſed*, or in a manner uſeleſs, and ſome of them too, known but to few; wherefore I have thought fit to give this ſhort account of *them*. To paſs by therefore the *Caſtle* of *Oxford*, ſo well known to be built by *Robert d'Oyly* who came in with the *Conqueror*, and the *Caſtles* of *Bampton* and *Banbury* ſpoken of before: the firſt that preſents it ſelf to my conſideration, is the old *Caſtle* of *Deddington*, formerly *Dathington* [g], which I take to be ancient, and the very place no queſtion to which *Aymer de Valence*, Earl of *Pembroke*, brought *Piers de Gaveſton* the great Favorite of King *Edward* the Second, and there left him to the fury of the Earls of *Lancaſter*, *Warwick*, and *Hereford*, who carrying *him* to *Warwick*, after ſome time, cauſed *him* to be beheaded in a place called *Blaklaw*, in their own preſence [h].

136. Secondly, the *Caſtle* of *Ardley*, the Foundations whereof are yet to be ſeen in a little Wood weſt of the *Town*, which if any heed may be given to the *tradition* of the place, floriſh'd about the time of King *Stephen*: and ſo perhaps thirdly, might *Chipping-norton* Caſtle; free leave being given at the beginning of his Reign, to all his Subjects to build them *Caſtles*, to defend him and them againſt *Maud* the *Empreſs*, which at laſt, finding uſed ſometimes againſt *himſelf*, he cauſed no leſs than eleven hundred of theſe new built *Caſtles* to be raſed again, which no doubt is the cauſe we find no more of them, but their bare *Foundations* and *Trenches*.

137. But fourthly, the *Caſtle* of *Middleton*, now *Middleton-ſtony*, was none of theſe, for I find *Richard de Camvil* had *Livery* given him of *Middleton Caſtle* in *Oxford-ſhire* (which muſt needs be this) the tenth of King *John*, as part of his own *Inheritance* by deſcent from his *Father* [i]. And fifthly, as for the ruins of old Fortifications at *Craumerſh*, or *Croamiſh Giffard* near

[g] *Thomas de la Moor in Hiſt. vitæ & mortis Edw. 2. in principio.* [h] *Ibidem.* [i] See Mr. *Dugdale's* Baronage of *England. vol. 1. Bar. Camvil.*

Wallengford, I take them either for the *foundations* of that *wooden Tower* erected by King *Stephen*, in the year 1139. when he beſieged *Maud* the *Empreſs*, and her Brother *Robert* Earl of *Gloceſter* in *Wallengford Caſtle* [k], or elſe of the *Caſtle* of *Craumerſe*, or *Croamiſh* it ſelf, built by the ſame King *Stephen* at another ſiege of *Wallengford*, *An.* 1153. which *Henry Fitz-Empreſs* endeavoring to raiſe, and bringing King *Stephen* to great ſtraits, they came at laſt to an accord concerning the Kingdom of *England* [l].

138. There are ſome other *Antiquities* of yet later date, that I have met with in *Oxford-ſhire* alſo perhaps worthy notice, ſuch as that odd *bearded Dart*, *Tab.* 16. *Fig.* 7. having the *beards* iſſuing from it, not as uſually one againſt another, but one lower and the other higher, perhaps thus contrived for its eaſier paſſage in, and as great or greater difficulty to get it out of a body; which were it not for the too long diſtance of time, I ſhould be willing to take for the *Materis*, *Mataris*, or *Matara*, the *Britiſh long Dart*, which were uſually thrown by thoſe that fought in *Eſſedis* [m]: But the *ſtem* of it being *wood*, and not very hard neither, I cannot afford it to be above 200 years ſtanding, or thereabout: Nor can I add more concerning it, but that it was found ſomwhere about *Steeple Barton*, and given me by the Worſhipful *Edward Sheldon* Eſq;

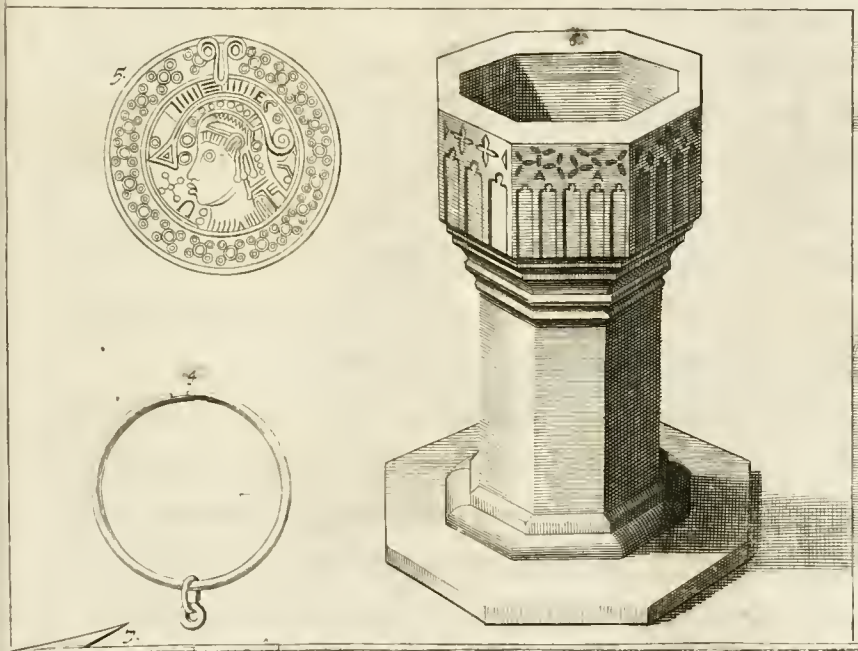
139. Yet the *ſtone* engraven *Tab.* 16. *Fig.* 8. dug up in the *garden*, and now in the poſſeſſion of the Right Worſhipful Sir *Thomas Spencer* Baronet, a moſt cordial *Encourager* of this *undertaking*, can ſcarce be allowed ſo ancient as *that*, the *Character* upon it in *Rilieve* work being certainly *China*: For unleſs we may imagin it brought thence in the days of King *Ælfred*, by *Swithelin* Biſhop of *Sherbourn*, *Qui detulit ad Sanctum* Thomam *in India Eleemoſynas Regis* Aluredi, *& incolumis rediit* [n], *i. e.* who carryed the offerings of King *Alfred* to the Church of St. *Thomas* in *India*, and returned ſafe, we can by no means allow it to have been here, 180 years; that *Country* having been quite loſt again to this *Weſtern* part of the *world*, till *Vaſquez Gama* was ſent by *Emanuel* King of *Portugal* to make new diſcoveries, in the year 1497. In which year, though he recovered the way again to the *Eaſt Indies*, yet *Fernandus Andradius* diſcover'd not *China* till 1517 [o]. So that

[k] *Chronica Gervaſii Dorobornenſis, & Floren. Wigorn. in An. citato.* [l] *Chron. Gerv. Doroborn. in An. citat.* [m] *Jul. Cæſar. Comment. de bello Gallico, lib.* 4. [n] *Joh. Bromton Ab. Jorn. in An.* 15. *Regis Aluredi.* [o] *Hieronymi Oſorii Hiſt. Luſitan. lib.* 11.

pro-

TAB. XVI.

ad pag: 356.



6.

7.

8.

To the right Worsp.ll
Sr. THOMAS SPENCER Baron.t one of the Noblest
Encouragers of this Essay
This 16.th Table
of some of the ANTIQUITIES of OXFORDSHIRE
whereof the last was dug out of His own grounds, in memory
of his Kindness is thankfully dedicated by
R. P. L. D.

M.C Burghers sculpsit

provided this *ſtone* (which is very unlikely) were brought thence by ſome of *Andradius* his company the very firſt *voyage*, yet it can be (with us) but 160 years ſtanding.

140. As for the *Stone* it ſelf it is of an odd kind of *texture*, and *colour* too, not unlike (to ſight) to ſome ſort of *cheeſe*, exactly of the *figure* and *bigneſs* as engraven in the *Table*; and moſt likely of any thing to have been one of their *Togrâ*'s, or *Stamps*, wherein the chief *perſons* of the *Eaſtern Countries* uſually had their *names* cut in a larger ſort of *Character*, to put them to any *Inſtruments* at once, without further trouble. That they have ſuch kind of *ſtamps*, is clearly teſtified by *Alvares Semedo*, in his *Hiſtory* of *China*: *They Print*, ſays he, *likewiſe with Tables of ſtone, but this manner of Printing ſerves only for Epitaphs, Trees, Mountains, &c. of which kind they have very many Prints; the ſtones which ſerve for this uſe being alſo of a proper and peculiar ſort* [p], as ours ſeems to be: So that in all probability the *letters* on this *ſtone* contain only the *name*, and perhaps the *office*, or other *title* of ſome perſon of *Quality*, and therefore hard to be found out; and that it was brought hither by ſome *Traveller* of the Honorable Family of the *Spencers*, and either caſually loſt, or careleſly thrown out as a thing of no value.

141. And thus with no ſmall toil and charge, yet not without the aſſiſtance of many Honorable *Perſons*, whoſe *names* in due time ſhall be all gratefully mention'd, I have made ſhift to finiſh this *Specimen* of *Oxford-ſhire*; which I am ſo far from taking for a perfect *Hiſtory*, that I doubt not but time and ſevere *obſervation* (to which I hope this *Eſſay* will both encourage and direct) may produce an *Appendix* as large as this *Book*: For that new matter will daily preſent it ſelf, to be added to ſome one or other of theſe *Chapters*, I am ſo ſenſibly convinc'd. that even ſince the *Printing* the firſt *Chapter* of this *Treatiſe*, I have found here at home juſt ſuch another *Echo*, as at Mr. *Pawlings* at *Heddington*, in the *Portico*'s of the new *Quadrangle* at St. *John Baptiſt*'s *College*. And ſince my writing the *ſecond*, my worthy Friend Dr. *Tho. Taylor* has found ſo ſtrong a *Chalybeat* Spring in *Fulling-mill-ham-ſtream* near *Oſeney Bridge*, that notwithſtanding laſt hard Winter (when the greateſt *Rivers* were frozen) this continued open and ſmoaking all the time, tinging all the *ſtones* by reaſon of its not running, nor

[p] *F. Alvares Semedo, Hiſt. Chin. part.* 1. *cap.* 6. *ſub finem.*

mix-

mixing with other water, with a deep *ruſty colour*. And thirdly, ſince the Printing the 48 §. of *Chap.* 8. I have ſeen a *Lapis Ranulæ* taken out from under the Tongue of one *Johnſon* a Shoo-maker (by the skilful Mr. *Pointer* Chirurgion) here in *Oxford*.

142. Which is all I have at preſent to offer the *Reader*, but that he would take notice, 1. That in *Chap.* 2. §. 69. where I mention a *Well* ſo eminent heretofore for curing *diſtempers*, in the Pariſh of St. *Croſſes*, that it has given it the more laſting name of *Holy-well*; that I intend not that *Well* of late erection (though perhaps the water of that is as good) and now moſt uſed, but an other ancienter *Holy-well* behind the *Church*, in Mr. *Nevil*'s Court before his houſe. And that ſecondly, notwithſtanding the authority of the Learned Dr. *Hammond* (with whom a man need not much be aſhamed to err) ſome will have, that he calls the *Well* of St. *Edward* in the Pariſh of St. *Clements*, rather the *Well* of St. *Edmund*, for which I find the very ſame *authority* alleged, that Dr. *Hammond* brings [q]. And laſtly to beg of him, that though in general he find me unequal to my *deſign*, and many particulars of this *Eſſay* perhaps ill placed, and worſe expreſſed, that yet in conſideration that this is my firſt *attempt* (wherein many *Inconveniencies* could not be fore-ſeen, which may hereafter be avoided) he would candidly accept of the *ſincerity* of my intention, with all imaginable endeavor of *amendment* for the future, in lieu and excuſe of my preſent *Inabilities*.

[q] *Vid. Hiſt & Antiq. Univerſ. Oxon. lib.* 2. *pag.* 10. *col.* 1.

FINIS.

ERRATA.

IN the Map, the Crown belonging to *Ewelm*, is miſ-placed at *Benſon*; and the mark for *Banbury* Caſtle wanting. In Tab. 7. Fig. 9. for *b b* read *a a*; and for *c c* read *b b*. In the Book, p. 34. line 4. for *neareſt*, r. *meereſt*. p. 56. l. 14. for *parts*, r. *ſorts*. p. 98. l. 8. r. *with metals*. p. 151. l. 29. r. *white Cone*. p. 155. l. 18. for *Hampton*, r. *Bampton*. p. 231. l. 27. r. *adaptata*. p. 253. l. 21. r. *induce*. p. 280. l. 2. r. *ſtained*. p. 323. l. 32. r. *regum*. p. 344. l. 31. r. ὀξύτητα.

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